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TABLE OF CONTENTS

Blindness in the British Commonwealth ARNOLD SORSBY, F.R.C.S. 557
Oedema during Macrocytic Anaemia E. G. HOLMES, M.D. 561
Sulphaemoglobinaemia due to Aniline Derivatives S. LAZARUS, M.D. 565
The Child with Frequent Colds D. H. IRWIN, M.B., and E. FRANKEL, M.D. 566
Mass Miniature Radiography of Factory Groups W. POINTON DICK, M.R.C.S. 568
A Case of Left-sided Appendicitis J. W. L. HADDON, M.B. 569

MEDICAL MEMORANDA

Four Cases of Hemicolectomy. HUGH MACCARTHY, F.R.C.S.I.&Ed. 570
Allergy to Egg-prepared Vaccines. R. G. PARK, M.D. 570

GENERAL ARTICLES AND NEWS

Annual Harveian Commemoration 577
Rheumatic Fever and Heart Disease: Harveian Oration by Dr. JOHN PARKINSON 578
British Civilians Released in China 578
Valve Disk for Circle Absorbers. J. CLUTTON-BROCK, M.B. 572
HEBERDEN SOCIETY MEETING 578
THE SERVICES 588
UNIVERSITIES AND COLLEGES 588
MEDICAL NOTES IN PARLIAMENT 588
MEDICAL NEWS 589

OBITUARY

W. B. Cannon, C.B., M.D. 586
T. P. Puddicombe, M.B., D.P.H. 586
G. Q. Lennane, F.R.C.S.I., D.P.H. 586
George Hall, M.B. 587
R. M. de Mowbray, F.R.C.S. 587
D. Johnston Jones, M.D. 587
W. S. McDougall, M.B., C.M. 587
J. C. Mottram, M.B. 587
Ernest Lancaster, M.B. 587
J. Macdonald Troup, M.B. 587

Epidemiology Section 590

LEADING ARTICLES

Dosage and Effects of Choline Chloride 573
Lung Disease in Coal-miners 574

ANNOTATIONS

Effects of Lightning 575
Nutritional Surveys in Italy 575
Relaxin 576

REPORTS OF SOCIETIES

ROYAL SOCIETY OF MEDICINE:
International Biological Standards: Dixon Lecture by Sir PERCIVAL HARTLEY 579
The "Discharging Lesion" in Neurology 580

LETTERS AND ANSWERS

Intermarriage of White and Black—Increasing Weight—Safety against Carbon Tetrachloride — Schistosomiasis — Fröhlich's Syndrome—Podophyllin for Warts—Prognosis after Splenectomy—Terminating Pregnancy — Income Tax —Breast-feeding—Fish-bone in Tonsil, simulating Neoplasm — Bart's in the War—Disclaimer—Correction 591-2

SUPPLEMENT

Heard at Headquarters 93
Eugenics and Post-war Reconstruction 94
A SERVICE FOR DOCTORS AND PATIENTS 93
SCOTTISH ASSOCIATION OF INSURANCE COMMITTEES 94
CORRESPONDENCE 95

CORRESPONDENCE

Telling the Patient. JOHN A. RYLE, M.D.; H. HARRIS, M.D.; E. IDRIS JONES, M.D. 581
Rehabilitation of Fractured Limbs. Sir MORTON SMART, M.D. 581
Sciatic "Neuritis." C. W. M. WHITTY, B.M. 582
Psychiatry in the Services. W. L. MILLIGAN, M.D.; A. HARRIS, M.D.; G. F. MAGURRAN, M.B.; W. E. HICK, M.B.; FLORENCE M. E. DAVIES, M.B. 582
Anaesthetic Risks. A. C. DOUGLAS, M.B. 583
Significance of the E.S.R. D. G. MCINTOSH, M.B., and D. M. KEAY, M.B. 584
"Perspex" in Orthopaedics. J. A. CHOLMELEY, F.R.C.S. 585
Third-generation Syphilis. C. C. WEDDERBURN, M.B. 585
Infant Feeding and Duodenal Ulcer. J. M. MORGAN, M.D. 585
Housing, Health, and Unwise Spending. E. H. WILKINS, M.B. 585
Training for Released Service Doctors. C. D. EVANS, M.P. 585
Nutritional Macrocytic Anaemia: Correction 586

REVIEWS

War and Social Psychiatry 571
History of Anaesthesia 571
Cosmetics 572
Notes on Books 572

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY OCTOBER 27 1945

THE INCIDENCE AND CAUSES OF BLINDNESS IN THE BRITISH COMMONWEALTH

BY

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Only a tentative estimate of the number of blind and the barest of assessments of the causes of blindness in the British Commonwealth as a whole are possible. Fairly complete data are available for England, Wales, and Scotland, but those for other parts of the Empire vary between being relatively adequate to negligible. Any final analysis is therefore out of the question.

1. THE NUMBER OF BLIND

The two fundamental difficulties in assessing the number of blind are the lack of a universally accepted definition of blindness and the lack of uniformity in the methods employed for collecting blind statistics.

In the census returns of most countries information is sought on physical and mental infirmities in the population. Those totally blind are asked to declare this fact. The census returns therefore deal with total blindness as determined by a lay assessment. A lay assessment also enters largely into the statistics supplied by voluntary agencies caring for the blind, though total blindness is not generally the only criterion used by such agencies in granting benefits. Statistics from such sources are far from comprehensive, as they deal with only that section of the blind population which seeks charitable relief, and their extent is, moreover, determined by the energy and resources of the agency in question; furthermore, lay assessment is still the general rule and appears to be particularly capricious when total blindness is no longer the criterion.

In contrast to these two distinctly fallible methods is the one that has emerged only recently as a result of the administration of the Blind Persons Act of 1920. Under this Act statutory benefits were made available to the blind in England, Wales, and Scotland, admission to the Register being obtained on medical certification—which of late has generally meant certification by an ophthalmologist. The data thus obtained have therefore considerable uniformity, but still cover only those who seek the statutory benefits that the Act allows. The fundamental difficulty as to what constitutes blindness is masked rather than solved by the statutory definition of "so blind as to be unable to perform any work for which eyesight is essential." In practice this has been interpreted—somewhat arbitrarily—to mean vision of 3/60 or less with a full field, or better central vision when associated with specified field defects.

For England, Wales, and Scotland data on medical certification by a definite, even if controversial, standard are thus available, and these data are limited only by the fact that not all blind persons seek certification. Elsewhere census returns are still the main source of information, but for some years now there has been considerable criticism of such returns. The data thus obtained have come to be regarded as so unreliable as not to be worth the trouble of collecting, and inquiries for personal infirmities have been discontinued in the censuses for 1921 and 1931 in Great Britain and in that for 1940 in the U.S.A. None the less census data are the fullest that are available for the greater part of the Commonwealth, and critically interpreted they are of considerable value, as will be shown in what follows.

British Isles

England and Wales.—In 1911, when the last census which sought information on infirmities was taken, there were 26,336 persons who declared themselves totally blind. When the Register under the Blind Persons Act was established there were found to be 25,840 eligible—a close approximation to the census figures. The number of registered blind has, however, increased steadily year by year, as the following figures show:

Year	Number on Blind Register	Year	Number on Blind Register
1920	30,785	1933	63,408
1921	34,894	1936	67,534
1923	36,518	1938	71,875
1925	42,140	1940	74,418
1927	46,822	1942	75,306
1929	52,727	1943	76,507
1931	60,598	1944	76,145

There is, of course, no reason for believing that the incidence of blindness has increased during 1920–44 in the startling proportions suggested by these figures; these merely represent an increasing efficiency in the registration of the blind. They furthermore indicate that registration has become fairly effective during recent years. It is also clear that the census figures were a gross underestimate, but it must be borne in mind that the criteria of blindness adopted for these two different returns were different; for the census it was total blindness, for the purpose of the Blind Persons Act it was—in practice—3/60. That the census returns were not quite meaningless is shown by the following findings: An analysis of 9,522 blind certificates in the Counties of London and Middlesex (Sorsby, 1945a) showed that 1,013 were totally blind and 1,822 had perception of light only. The rest mostly had vision up to 3/60. Thus some 2,835 qualified for what a layman would regard as total blindness, making 29.9% of all registered blind in these areas. If it is taken that 30% of all the registered blind in the country are blind in the lay sense indicated (i.e., no perception of light and perception of light only), an incidence of blindness approximating that shown by the census figures of 1911 is obtained. It is impossible to assess the number of blind persons who have not sought registration. At hospitals one still sees certifiably blind patients who have not been registered, while an unknown proportion for various reasons decline certification. It is safe to conclude that the number of blind people in England and Wales is not less than 80,000 and is unlikely to exceed 100,000.

Scotland.—The census for 1911 showed 3,317 blind persons in a population of 4,760,904 (or 70 per 100,000). The number of registered blind persons was 4,104 in 1919—a close approximation, as in England and Wales, to the census figure. But again as in England and Wales it has risen steadily, the rise being confined to the years up to 1929.

Year	Number on Blind Register	Year	Number on Blind Register
1919	4,104	1933	8,678
1921	5,138	1936	8,500
1923	5,754	1938	8,973
1925	6,332	1940	8,908
1927	6,939	1942	8,891
1929	8,518	1944	8,804
1931	8,821		

The Dominions

Canada.—The census figures for 1931 showed 7,343 blind persons in a total population of 10,376,786 (or 71 per 100,000). Statutory benefits for the blind were introduced by Act of Parliament in 1937, and by July, 1938, there were over 3,000 applicants for blind pensions. This was distinctly less than the 4,712 blind on the registers of the Canadian National Institute for the Blind in 1927, but the number of registered blind (? under the Act of 1937) had risen to 12,854 by 1944. It would therefore seem that in Canada the experience of England and Wales is being repeated, and that the number of registered blind is likely to increase. In Newfoundland the number of registered blind in 1944 was 219. The 1911 census showed 287 blind in a population of 242,619 (118 per 100,000).

South Africa.—In an official inquiry carried out in 1936 concurrently with the census there were 1,624 blind amongst the white population of 2,003,857, or 81 per 100,000. No adequate data are available for the coloured population: the same inquiry covering 769,661 coloured persons, excluding Bantu and Asiatics, showed 981 blind (127.7 per 100,000). At the end of December, 1940, the South African National Council for the Blind had detailed information regarding 17,263 blind persons in the Union; there were 1,828 Europeans, 1,632 coloured, and 13,803 natives. Since then, and especially since 1942, when the payment of an increased grant to blind natives was introduced, the Council has been "inundated with registrations of blind natives and the total had increased by leaps and bounds." Recently the Act allowing grants to blind people has been amended to include Indians. There is as yet no information as to the number of blind Indians in the country. By December, 1943, the total number of registered blind had risen to 30,834, and consisted of 2,103 Europeans, 1,887 coloured, and 26,844 natives. On the basis of an estimate of the population supplied by the Director of Censuses the rate per 100,000 at the end of 1942 for the three different communities was: European 91, coloured 211, natives 351.

Australia.—The 1933 census for the Australian Commonwealth showed 3,898 blind in a population of 6,229,839 (63 per 100,000).

New Zealand.—The census for 1916 showed 570 blind in a population of 1,009,449. The New Zealand Institute for the Blind in 1936 estimated the number of blind at 1,000 for the whole country, or 70 per 100,000 (against 56 shown by the census of 1916). It had records of 720 blind, and of these 688 were totally blind. (It is unlikely that with 688 known cases of "total blindness" the total number of blind, by English standards, would be only 1,000.)

The total white population of Canada, Newfoundland, South Africa, and Australasia is of the order of 20 millions. The census rates of blindness per 100,000 were 71 for Canada (1931), 118 for Newfoundland (1911), 81 for South Africa (white population, 1936), 63 for the Australian Commonwealth (1933), and 56 for New Zealand (1916). These are not dissimilar from the census rate of 73 for England and Wales and 70 for Scotland in 1911. If it is concluded, on the strength of experience in England and Wales since the working of the Blind Persons Act, that the actual rate is about 200–250 per 100,000 (on the basis of a computed number of 80–100,000 blind in a total population of 40,000,000), the total of blind amongst the white population of the Dominions is of the order of 40–50,000.

Other Possessions

India.—The census for 1931 showed 606,360 blind in a population of 352,837,778—a rate of 172 per 100,000. It is generally agreed that this is a considerable underestimate. If the rate of blindness known for England and Wales applied to India, its population of over 400,000,000 would provide 800,000 to 1,000,000 blind. But blindness in India is far more common than in England and Wales, and it appears that Indian census figures on blindness are grossly vitiated by the widespread illiteracy and by superstitious fears. On studies undertaken in selected areas both Henderson and Kirwan hold that the census figures indicate only one-third of the blind in India; Megaw puts it as low as one-quarter. Moreover, even these observers, in speaking of blindness, use a considerably lower criterion than that now used in England—i.e., counting fingers at one metre instead of 3/60. At the very least the census figure of 606,360 must therefore be multiplied by three or four. This gives the number of those totally or subtotally blind as between 2 and 2½ millions. For the present this must be accepted as a minimum figure. The actual number is likely to be considerably more, for India is one of the classical countries of blindness, and according to O'Dwyer "there is no country in the world to-day where the affliction of blindness is so widespread." This being so, a comparison with Egyptian and Palestinian figures rather than with those for England and Wales is called for. In both Egypt and Palestine the census figures indicate a rate of blindness 10 to 15 times that for England and Wales. On that basis the blind in India number between 10 and 15 millions.

Ceylon.—The census for 1921 showed 4,005 blind in a population of 4,498,605—a rate of 89 per 100,000. There is no reason for believing that the situation in Ceylon is substantially different from that of India, and the census figure must be regarded as a serious underestimate.

Egypt.—The appalling rate of 1,325 blind per 100,000 was recorded by the census of 1907. Ten years later it had declined to 1,222, whilst in 1927 it fell to 775 (109,934 blind in a population of 14,177,864).

Palestine.—Palestine has the world's highest census rate for blindness. It was 843 per 100,000 in the 1931 census (8,172 blind in a population of 969,268), surpassing the rate of 775 recorded for Egypt in 1927. In contrast to the high rate for the Muslims of the country, that for the Jews is relatively low, and for Christian Arabs intermediate between the two (Muslims 1,061, Christians 564, Jews 139 per 100,000).

African Colonies.—No adequate data are available for the greater part of Africa. The native population in Uganda in 1911 showed a census rate of blindness of nearly five times that of England and Wales (354 against 73 per 100,000). It is not known whether blindness in the native population in Africa is of the order of frequency seen in India, Egypt, and Palestine. That blindness is extremely frequent, and indeed far more frequent than anywhere else in the world, is suggested by the following findings concerning natives in the Union of South Africa: Rosset-Berdez (1944) in an inquiry for the South African Government examined 4,500 natives; only 527 (13.2%) were normal; 214 (5.3%) were totally blind; 360 (9.0%) had lost one eye as a result of disease.

Pacific Islands.—Information is scanty. The census for 1911 for the Fiji Islands showed 1,385 blind in a population of 137,248, giving a rate of 1,009 per 100,000—i.e., a rate of the order of Egypt and Palestine. It is not known whether the Fiji Islands can be regarded as typical of Indonesia.

It is obvious that, whatever be the definition of blindness, no final assessment of the number of blind in the British Commonwealth is possible. A fairly clear indication is available for the 46,000,000 in England, Wales, Scotland, and Northern Ireland: it cannot be less than 90,000 and is likely to exceed 100,000. For the 20,000,000 whites in Canada, Newfoundland, Australasia, and South Africa the number of blind is likely to be 40–50,000. As for the native populations of the British possessions in Africa, Asia, and Indonesia, their blind would number about 1¼ million if blindness were no more common among them than it is in the British Isles and the Dominions, but it is likely that the actual figure is considerably more than 10 millions.

2. THE CAUSES OF BLINDNESS

Data on the causes of blindness in England and Wales and in Scotland are fairly adequate. Elsewhere the information is scanty.

England and Wales.—No less than 77.2% of the 76,507 registered blind in 1943 were over 50 years of age; 20.8% fell in the age group 16–50 years, and 2.0% in that of 0–16 years. Analyses of the data as to the age at onset of blindness do not affect substantially the outstanding fact that in most cases blindness is an affliction that, in the phrase of the *Iliad*, sits on the sad threshold of old age. As to the causes of blindness, the Prevention of Blindness Committee (1938) gives an analysis of 5,290 blind certificates and the Northern Counties Association for the Blind (1938) of 10,000 certificates. Both agree in

placing cataract first with 25.0% and 33.6% of the total respectively; in both series glaucoma takes the second place with 11.8% and 10.0% respectively. Defects of congenital, hereditary, and developmental origin, and myopia take the third and fourth places in the first series (with 11.0% and 10.2% respectively), and occupy the reverse order in the second (with 7.0% and 8.5% respectively). Taken together, these four causes—cataract, glaucoma, defects of congenital, hereditary, and developmental origin, and myopia—account for 58.0% in the analysis of the Prevention of Blindness Committee and 59.1% in that carried out by the Northern Counties Association for the Blind. Substantially the same result was obtained in an analysis of 9,562 registered blind in the Counties of London and Middlesex (Sorsby, 1945a). Cataract and glaucoma again took the first and second places with 21.2% and 14.0% respectively, whilst myopia accounted for 12.1% and defects of congenital, hereditary, and developmental origin for 10.4%, the total for the four main causes being 57.7%. When this series of 9,562 cases is analysed in age groups a considerably different picture emerges.

(1) In the age group 0–14 years (143 cases) defects of congenital, hereditary, and developmental origin lead with 67.1%, and ophthalmia neonatorum is second with 5.6%, the remaining causes all being considerably less significant.

(2) In the age group 15–29 years (656 cases) defects of congenital, hereditary, and developmental origin still lead with 38.4%, with congenital syphilis in the second place with 14.0%.

(3) In the age group 30–49 years (1,303 cases) the leading cause is still as in the other two age groups, this time with 21.3%, and with myopia in the second place with 15.5%. Congenital syphilis is now third with 13.1%.

(4) In the age group 50–69 years (3,541 cases) myopia leads with 18.6%; glaucoma and cataract come second and third with 15.2% and 14.0% respectively.

(5) In the age group of 70 years and over (3,725 cases) cataract is responsible for 39.3% and glaucoma for 19.3%, with senile macular lesions in the third place with 11.7%.

The numerical frequency of cataract and glaucoma, which is so striking a feature in the statistics for the blind population, gives an exaggerated significance to these two causes. When the causes operative in the different age groups are evaluated in terms of years of expectation of life—i.e., in expected years of blindness—cataract falls from the first place to the third with 13.1% of the total of expected years of blindness, and glaucoma falls from the second to the fourth place with 10.0%. Defects of congenital, hereditary, and developmental origin, which in order of frequency are fourth, now assume a preponderant first place with 22.9%, and myopia takes the second place with 16.0%. The congenital and congenitally determined anomalies (such as myopia) together are thus responsible for no less than 38.9% of the total of expected years of blindness, whilst cataract and glaucoma together, though numerically so outstanding, account for considerably less—viz., 23.1%. On this reckoning congenital syphilis is also a cause of some importance, accounting for 8.8%, with ophthalmia neonatorum not far behind (6.2%). If these provisional data on the blind in London and Middlesex apply to England and Wales as a whole, the major causes of blindness are not cataract and glaucoma but, in order of frequency, defects of congenital, hereditary, and developmental origin, myopia, cataract, glaucoma, congenital syphilis, and ophthalmia neonatorum.

Scotland.—As in England and Wales most of the blind are over 50 years of age (the actual percentage for 1943 being 74.1 against 77.2 in England and Wales). Marshall and Seiler's study of 2,885 registered blind in Glasgow and South-West Scotland places myopia as the first of causes with 15.9%; cataract, chronic septicaemia, glaucoma, and congenital anomalies follow with 15.2%, 10.9%, 8.9%, and 8.1% respectively. Ophthalmia neonatorum occupies the eighth place with 3.4%. Calculated in years of blindness the patients in these different categories had experienced, chronic septicaemia comes first (with an average of 12 years); congenital, hereditary, and developmental anomalies second (11.4 years); myopia third (10.3 years); and ophthalmia neonatorum fourth (10.1 years). Cataract and glaucoma come low with the eighth and tenth place respectively. These findings agree with those for London and Middlesex on the significance of defects of congenital, hereditary, and developmental origin, and of myopia as foremost causes of blindness.

The Dominions.—No adequate data are available. There are various analyses of returns from blind schools and institutions and from records of patients seen by ophthalmologists in practice. They give the impression that in Australia, New Zealand, and Canada, at any rate, the same causes of blindness operate as in the British Isles. Registers of blind persons, comparable in completeness as to numbers and causes, do not appear to be available for any of the Dominions, except possibly South Africa. Here a register in the process of formation provides data on the causes of blindness in 26,844 natives and 2,103 whites registered by December, 1943. The main causes recorded were:

	White (2,103 Cases)	Native (26,844 Cases)
	%	%
Cataract (senile, traumatic, and unspecified) ..	9·7	42·6
Syphilis	11·2	5·8
Glaucoma	7·2	2·4
Trachoma	5·0	2·0
Local infections of coats of eye	4·5	8·9
Ophthalmia neonatorum	4·4	0·8
Congenital, hereditary, and developmental defects (including congenital cataract)	20·9	1·2

Without a fuller knowledge of local conditions and the way these data were collected, the interpretation of these findings is difficult. A significant observation is the finding of trachoma in 135 natives out of 10,591 examined in a special investigation (Rosset-Berdez).

India.—Several analyses of the causes of blindness in relatively small series are available. In a series of 2,750 reported by Megaw cataract was responsible for 23%, glaucoma and smallpox for 9.0% each, and trachoma for 8.0%. In a series of 2,044 blind eyes Gnanadikam found that among those blind in both eyes the order of frequency of the causes was glaucoma, corneal ulcer, keratomalacia, trachoma, iritis, smallpox, and gonorrhoeal ophthalmia. Another observer (Bagchi) gives the following order of frequency in 3,404 persons blind in one or both eyes: anterior staphyloma, 39.7%; trauma, 7.0%; trachoma, 6.2%; leucoma, 5.9%; keratomalacia, 5.5%. In 74 inmates of the Calcutta Blind School Indra found the following distribution: congenital, 15 cases; smallpox, 11; syphilis, 10; ophthalmia neonatorum, 5; keratomalacia, 4—the last being regarded as an underestimate of the frequency of the affection, "as few such children can afford the expenses of the Blind School." Wright (1937) gives the principal causes in order of importance as:

In Children	*In Adults*
Keratomalacia	Cataract
Ophthalmia neonatorum	Optic atrophy (mainly syphilitic)
Congenital syphilis	Corneal ulcers
Hereditary blinding disease	Glaucoma
	Trachoma

while in both children and adults irritant remedies (the result of ignorance and the lack of adequate facilities for treatment) and smallpox are potent factors. All these assessments have one thing in common: the immense amount of blindness caused by various uncontrolled infective processes and by malnutrition.

Egypt.—In a cumulative list of causes of blindness published in the reports of the ophthalmic hospitals the predominant cause of blindness in some 75,000 cases [? eyes] are shown as conjunctivitis with corneal complications and its sequelae. Some 82% of all blind fell into this category, and it appears that acute ophthalmia rather than trachoma is the main form of conjunctivitis leading to blindness. Glaucoma is also a cause of some significance.

Palestine.—The reports of the Ophthalmic Hospital of the Order of St. John, Jerusalem, give a parallel analysis to that in the Egyptian reports and the findings are similar. Some 78% of all blindness is caused by conjunctivitis and its corneal complications. Shihab (1937) holds that some 75% of all blindness is caused by the acute ophthalmias, and that the two extremes of age are most susceptible.

Trinidad and Tobago.—In a study of the causes of blindness in 194 patients Métivier found syphilis the cause in 45 instances, glaucoma in 38, and leprosy in 14. Other significant factors were cataract and purulent ophthalmia.

African Colonies.—Little is known of the causes of blindness in the African colonies. Trachoma is probably rare but not unknown, as was previously believed. Two recent studies have drawn attention to onchocerciasis (Ridley, 1945; Scott, 1945). It is not known whether the incidence and causes of blindness seen in the natives of the Union of South Africa are typical of the African population as a whole.

3. PREVENTION OF BLINDNESS

In England smallpox figured as the main cause of blindness in such assessments as are available for the early years of the last century. Towards the end of the century ophthalmia neonatorum was the largest single cause; in a collective survey carried out by the Ophthalmological Society in 1884 it was found responsible for between 30 and 40% of blindness seen at blind schools and institutions. These findings may be taken as indicative of the role of infectious diseases as causes of blindness in this country during the last century. To-day infectious disease—both exogenous and endogenous—accounts for only a small proportion of all blindness; in the survey for the Counties of London and Middlesex it stood at not much more than 15% (Sorsby, 1945a). Generally speaking, the most significant cause in the undoubted decline in the incidence of blindness in England, and in advanced countries generally, has been the control of infectious disease by public health measures, adequate facilities for treatment, and of late years the advances in chemotherapy, beginning with arsphenamides in the treatment of syphilis. Other causes in the decline of blindness have been the development of ophthalmology, the rise of eye hospitals and eye departments, and the perfection of operative techniques for cataract and glaucoma.

England and Wales.—The decline in the incidence of blindness in England and Wales is hardly reflected by the mounting number of registered blind since 1920. That a decline has taken place is suggested by the census findings since 1851, which have shown a steady diminution in the rate of incidence per 100,000 with each census. The rate in 1851 was 102; it declined to 96, 95, 88, 81, 78 at the subsequent decennial censuses, falling to 73 in 1911. More definite evidence is supplied by the returns for the age group 5–16 years under the Blind Persons Act of 1920. Unlike those for the other age groups, the returns for this group may be taken as giving a true presentation, for children come under the care of the school authorities, and the blind child is unlikely to escape registration. In contrast to the increase in the total number of registered blind, there has been a striking decline in the number of registered blind children, as the following table shows (Sorsby, 1945b).

TABLE I.—*Incidence of Blindness in Children aged 5–16 Years, England and Wales, 1823–43*

Year	Population aged 5–16 Years	No. of Registered Blind aged 5–16 Years	Rate per 100,000
1923	7,477,143	2,723	36·4
1925	7,306,761	2,720	37·2
1927	7,385,359	2,554	34·6
1929	7,262,590	2,438	33·6
1931	7,166,056	2,355	32·9
1933	7,246,446	2,089	28·8
1936	6,890,730	1,853	26·9
1938	6,694,300	1,676	25·0
1939	*	1,619	24·2†
1940	*	1,499	22·4†
1941	*	1,425	21·3†
1942	*	1,369	20·5†
1943	*	1,355	20·3†

* Population figures not available for publication. †On 1938 population figures

A decline to almost a half in the space of twenty-one years is a gratifying testimony to the efficacy of the many measures that are operative in the prevention of blindness. But it cannot be assumed that this trend is applicable to the whole blind population. In fact it is likely to be almost entirely confined to the lower age groups. It has already been seen that the causes of blindness are notably different in the different age groups and that nearly 80% of the blind are over 50 years of age. There is no reason for believing that blindness from cataract, glaucoma, myopia, and senile macular lesions—the causes operative in that age group—is declining to any marked extent, while the evidence available for the causes of the decline in the incidence of blindness in the young indicates that the reduction in them is wholly due to the elimination of the sequelae of infectious disease. This is brought out by the following comparative table of the causes of blindness seen at provincial blind schools in 927 children in 1922, and 524 in 1944 (Sorsby, 1945b).

TABLE II.—*Proportionate Incidence of the Main Causes of Blindness at Provincial Blind Schools in 1922 and 1944*

	Board of Education, 1922 (927 Cases)	Present Series, 1944 (524 Cases)
	%	%
Ophthalmia neonatorum	30·4	9·2
Purulent ophthalmia of later years ..	2·5	—
Phlyctenular ophthalmia	3·7	0·2
Interstitial keratitis	4·1	0·9
Iridocyclitis	2·5	0·8
Choroiditis	?	0·8
Syphilitic lesions	?	2·5
Optic atrophy	12·9	5·3
Congenital anomalies:		
Including myopia	37·2	67·6
Excluding myopia	30·8	55·0

This table shows a striking reduction in blindness from ophthalmia neonatorum and suggests a corresponding decline in blindness from congenital syphilis. As a corollary, blindness due to defects of congenital, hereditary, and developmental origin (in which myopia may be included) has assumed a proportionately increased significance. Two conclusions suggest themselves:

(1) The decline in the incidence of blindness in children is likely to come to an end within foreseeable time, in view of the fact that already some 65% of all blindness in children is due to defects of congenital or congenitally determined origin, and such defects are not readily amenable to treatment. It is therefore likely that blindness in children 5–16 years old will decline from its present rate of about 20 per 100,000 to about 12–14 per 100,000, but will remain at that level until more is known of congenital and congenitally determined disease.

(2) No substantial decline of the blind population as a whole is to be expected so long as there is no fuller knowledge of cataract, glaucoma, myopia, and the senile degenerations of the fundus oculi. Such decline as may be expected from better facilities for treatment may well be balanced by the shift towards more people in the high age groups of the population as a whole.

A century of effort in public health legislation, hospital administration, bacteriology, and pharmacology is reflected in the diminution of the incidence of blindness. The further operation of these forces is likely to reduce blindness still more, but at an ever-diminishing rate. Substantial advances can only come with intensive studies of the nature of genetic disease and intra-uterine infections on the one hand, and of cataract, glaucoma, and senile degenerations on the other. These are not all exclusively ophthalmic problems, any more than was blindness from infectious processes. In ophthalmology, however, these problems in pathology have become formulated perhaps more clearly than in other specialties.

Scotland.—In Marshall and Seiler's study of 3,219 blind persons 113 were aged 0–15 years, and of these 37 were blind from defects of congenital, hereditary, and developmental origin and 3 from myopia. This is a considerably lower incidence than that noted for the provincial blind schools of England. Proportionately there was more blindness from infectious disease. For the higher age groups their findings are essentially parallel with those for London and Middlesex.

The Dominions.—In the absence of more definite data it may be assumed that the problems of the prevention of blindness in the white population are similar to those established for the British Isles.

Africa.—The limited inquiry of Rosset-Berdez for South African natives suggests that one in every twenty Africans is blind. If this is true and applies to Africa as a whole, it is unbelievable that such a state of affairs is not largely remediable. Fuller information is an urgent first step.

India.—Such Indian blind statistics as are available give prominence to lesions like anterior staphyloma (39.7% in one series), leucoma, and corneal ulcer. Trachoma is known to be endemic in some parts of the country; smallpox is still a significant cause of blindness, while ophthalmia neonatorum and congenital syphilis are recognized as important causes of blindness in children. All this is reminiscent of England at the

beginning of the last century. The control of blindness in India is thus largely a problem of the control of infectious disease. That this is not purely an issue of pathology and pharmacology is obvious enough from the history of public health in Western Europe, and is grimly emphasized by the fact that keratomalacia —a nutritional deficiency disturbance—is ranked as first among the causes of blindness in children. The problem of blindness in India is not one of the elimination of a particular infectious disease such as trachoma or the acute ophthalmias. It has to be conceived in terms of standards of living, education, facilities for treatment, and adequate and well-trained ophthalmic personnel. None the less there is much that can be done immediately both outside and as part of the long-term plans—how much, can be seen more clearly from a consideration of the position in

Egypt and Palestine.—Here the social problems are not dissimilar in their broad aspects from those seen in India, but unlike in India two clearly defined infectious diseases are the main causes of blindness—the acute purulent ophthalmias and trachoma. Purulent ophthalmia, the more significant cause, is now easily treated by the sulphonamides and by penicillin. An immediate and striking reduction of blindness in Egypt, Palestine (and, indeed, throughout the whole of the Near and Middle East), and perhaps India, could be brought about by the organization of relatively simple treatment stations and possibly mobile units, with adequate supplies of the new chemotherapeutic and antibiotic agents. Trachoma, too, could be considerably reduced by such stations, for the beneficial effect of sulphonamide therapy in trachoma is no longer open to doubt; moreover, there are indications that penicillin may also be highly effective. The creation of such treatment stations will in any case have to be undertaken in any long-term programme, but a sense of urgency has now been supplied by the availability of the new therapeutic agents, for each day that such treatment is not available to the millions of Africa and Asia adds many blind to the roll of the avoidably blinded.

Summary

1. The number of blind in the British Isles is not less than 90,000 and is likely to exceed 100,000. In the white population of the Dominions it is between 40,000 and 50,000. In the native population of the British possessions in Africa, Asia, and Indonesia it is considerably more than 10 millions.

2. There has been a marked decline in the incidence of blindness in childhood in England and Wales during the past 21 years, but there is no evidence that there has been any substantial decrease in the older age groups. Before long the decline in the incidence of blindness in childhood will come to an end, as already about 65% of all blindness in children is due to congenital and genetic infections not readily amenable to treatment. With the rapid elimination of blindness due to infectious disease, intensive research in the problems of genetic disease, maternally transmitted infections, cataract, glaucoma, and the pathology of senescence, has become an immediate task if the incidence of blindness in England and Wales is to be reduced.

3. In the native populations of the British possessions the incidence of blindness could be reduced immediately and effectively by the organization of facilities for the intensive exploitation of the sulphonamides and penicillin in the treatment of the widely prevalent ocular infections.

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OBSERVATIONS ON OEDEMA OCCURRING DURING THE COURSE OF MACROCYTIC ANAEMIA

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"Tropical" or "nutritional" macrocytic anaemia is described in the textbooks, and Wells in India, Trowell in Africa, and a number of other workers have investigated it. Unfortunately, Service conditions render this literature inaccessible, and in this account of certain features of the disease which seem of practical importance I may be treading on ground that has already been covered. Reference to previous work is omitted from necessity, not from negligence.

The textbooks describe the disease as an anaemia, often severe, of a macrocytic type, occurring in India, Africa, the Balkans, and southern United States, among populations suffering from poor nutrition. It is often seen in pregnant women. It is accompanied by fever, diarrhoea, sore tongue, and sometimes oedema (which seems to have been referred to cardiac decompensation). Achlorhydria is said not to occur. Haemolytic and non-haemolytic types of the condition are distinguished.

Discussion with fellow officers suggests that many cases of this kind occur in South-East Asia Command; most commonly among Indian troops, less so among East Africans, occasionally among West Africans, and hardly ever among British soldiers. It is proposed to discuss a series of 38 cases among East Africans, laying stress on certain features.

Table I shows the frequency with which the signs and symptoms mentioned above were observed in this series. Anaemia of a more or less severe degree was noted in all (several patients had blood counts of less than one million red cells when they came under observation). It is not proposed to comment especially on the cytology, which conformed to the textbook description. Macrocytosis was observed in all cases, and normoblasts were seen on a number of occasions. The absence of an adequate centrifuge precluded determinations of mean corpuscular haemoglobin concentration, or of other features requiring haematocrit readings. On several occasions the cells were reported to be macrocytic and hypochromic. Sternal puncture was done in several cases. It always revealed an actively normoblastic marrow. Sickling of the red cells was never observed, nor was increased fragility, even in cases which were clinically of a haemolytic type. No neurological lesions of any kind were noted.

Table I

Total cases	38
Glossitis	12
Gastric HCl after histamine:	
Absent	12
Present	16
Not determined	10
Jaundice	5
Splenomegaly	12
Diarrhoea	17
Oedema and/or ascites	12

While gross anaemia can be missed only through negligent examination, it will be obvious that the other signs and symptoms, except the oedema and ascites (which will be discussed more fully) and the achlorhydria, may be attributed to a number of complaints very common in South-East Asia Command. Haemoglobin determinations alone are insufficient to exclude a moderate anaemia of this type. The only safe procedure is to count the red cells as well as to estimate the haemoglobin. At the least, a well-prepared thin film should be examined by a reliable observer. In this hospital some cases were certainly missed before this point was appreciated.

Fever is usual in the more severe cases, and may be mistaken for that of malaria or other illnesses. Diarrhoea may be attributed to dysentery or to infestation with worms or flagellates. Several cases at first labelled "non-specific diarrhoea" proved later to be macrocytic anaemia. Splenomegaly may be attributed to malaria or schistosomiasis; and indeed, in the cases under consideration, it was difficult to be sure whether the enlarged spleens observed were in truth connected with the

anaemia or with a legacy from earlier disease. Jaundice, when present, is more likely to suggest infective hepatitis than anaemia.

Prominence of one or more of these signs may lead to a wrong diagnosis unless the possibility of macrocytic anaemia is kept in mind as an underlying cause, and appropriate investigations made.

The occurrence of oedema and ascites merits special discussion. Fairley and Low (1939) attribute it to the cardiac insufficiency. It occurred in 12, or nearly one-third, of the present series of cases; in all but one, however, it did not appear until, as a result of treatment, the blood count had risen considerably. At this time other signs which could be attributed to cardiac decompensation were entirely absent.

Dietary deficiency is known to be a cause of macrocytic anaemia, and although an East African soldier's diet is probably better than that to which he is generally accustomed in civil life, it contains only 41 g. of first-class protein. The manufacture of haemoglobin involves the synthesis of protein as well as the manufacture of the iron-containing haem molecule. For every gramme of iron in haemoglobin there are some 800 g. of protein. If an individual with 6 litres of blood in his body is to raise his haemoglobin by 1 g. per 100 c.cm. of blood he must manufacture 60 g. of protein. It is not uncommon in these cases for the haemoglobin to fall as low as 6 g. per 100 c.cm., in which case to restore it to normal nearly half a kilogramme of protein will have to be forthcoming. Further, the protein moiety of haemoglobin is believed to belong to a class of proteins which are known to be particularly rich in diamino-acids, such as arginine and lysine, and, since there is evidence that these substances cannot be synthesized in the body, proteins which contain them must be eaten. Even so, it is possible that a good many molecules of food or body protein have to be broken down before the necessary constituents can be obtained for the manufacture of a molecule of haemoglobin. This may result, during the periods of blood regeneration, in a very heavy drain on the total protein resources, during which the plasma protein may become depleted.

It has been held that the plasma proteins do not form part of the general protein currency of the body. This can hardly be maintained in view of the work of Schoenheimer and his collaborators, who showed that if amino-acids containing "heavy" nitrogen were introduced into the body either by injection or by feeding, the "heavy" nitrogen atoms could soon be identified in the protein of all the body tissues, including the plasma.

Once the osmotic pressure exerted by the plasma protein falls below a certain critical level fluid can no longer be held in the capillaries, and oedema or serous effusions result. If a diminution of plasma proteins does in fact determine the occurrence of oedema and effusion in these cases it should be possible to demonstrate it, and observations were undertaken with this end in view.

After the work had been planned and started, a copy of the *B.M.J.* for Jan. 13, 1945, became available. This contained a paper by Trevor Davies recording a case of oedema during recovery from anaemia. He found that the total serum protein, when the oedema was fully developed, was 4.16%, the albumin 1.8%, and the A/G ratio 0.76/1. At this time the red cells numbered 3,700,000. A month later, as a result of plasma transfusion and protein feeding, the total serum protein was 5.61% and the A/G ratio 1.5/1. The writer quotes another case of plasma transfusion in severe microcytic anaemia (J. McD. Holmes, 1944)—not available here. He also quotes Heath and Taylor (1936) as stating that for a rise in 10% of the haemoglobin level 80 g. of protein must be retained.

The equipment necessary for plasma protein estimations is not provided in the laboratory of a field hospital, and the method used, based on that of Walther (1941), had partly to be improvised. Details are given in the Appendix to this paper. All the determinations were made on sera, since plasma could not be freed from cells without a centrifuge.

In the first instance a number of estimations of total serum protein were carried out. Though in several instances the total serum protein of cases with oedema was much diminished (e.g., the patient had a total serum protein of 4.9%, with gross oedema, on Dec. 24, 1944) the figures did not clearly establish the point at issue, but the figure for total serum protein may not be a sufficient criterion. The osmotic pressure of the serum depends upon the sum of the osmotic pressures of its albumin and globulin components (that exerted by fibrinogen is very small). The albumin is the smaller molecule, and is said to exert about four times the osmotic pressure of the globulin. A serum in which the albumin is decreased and

TABLE II.—*Cases without Anaemia or Oedema*

Serum	Total Protein (g./100 c.cm.)	Albumin (g./100 c.cm.)	Globulin (g./100 c.cm.)	A/G Ratio	N.P.N. (mg./100 c.cm.)	Remarks
1	8·43	5·66	2·77	2/1	28	Mixed sera for Kahn tests
2	8·53	6·38	2·15	3/1	28	" " "
3	6·96*	5·84	1·12	5·2/1	47	" " "
4	5·72	3·40	2·32	1·5/1	28	" " "
154265	9·94	6·34	3·60	1·76/1	33	Oedema (slight) of legs. No anaemia. Periostitis of tibiae (inflammatory oedema)
8066	8·15	4·50	3·65	1·23/1	16	A case of schistosomiasis. Formol-gel test negative
14404	8·07	3·28	4·79	0·68/1	29	A case of schistosomiasis. Formol-gel test weakly positive (high globulin)

TABLE III.—*Cases with Anaemia*

Regimental Number	Date	Total Protein (g./100 c.cm.)	Albumin (g./100 c.cm.)	Globulin (g./100 c.cm.)	A/G Ratio	N.P.N. (mg./100 c.cm.)	R.B.C. (millions per c.mm.)	Remarks
*N/25528	1/1/45	5·50	3·40	2·10	1·6/1	?	2·02	No oedema or ascites
44131	15/4/45	7·50	4·10	3·40	1·2/1	33	(Hb 3·6 g.)	Severe anaemia, very ill. No oedema or ascites
G/1419	21/6/45	6·07	3·26	2·80	1·16/1	19	1·64	" " "
40866	25/4/45	4·77	2·89	1·88	1·5/1	28	2·59	R.B.C. rising. Oedema +++, ascites +++. Pleural effusions
40866	6/5/45	6·01	2·58	3·43	0·75/1	28	2·34	Oedema ++, ascites ++. Pleural effusions
N/22916	29/4/45	7·81	2·90	4·91	0·59/1	27	3·10	Oedema +, ascites ++
N/22916	9/5/45	5·92	2·07	3·85	0·54/1	19	4·94	Oedema ++, ascites +++
N/22916	30/5/45	7·55	3·02	4·53	0·66/1	24	4·26	No oedema. Some ascites, but much less than before
N/22916	19/6/45	7·08	3·00	4·08	0·73/1	11	4·48	No oedema or ascites
ZBK/12410	9/6/45	6·83	2·56	4·27	0·59/1	16	3·99	Ascites +
DN/22926	30/5/45	5·70	2·66	3·04	0·87/1	115	2·98	Chronic nephritis. Gross oedema and nitrogen retention
DN/22926	6/6/45	5·03	2·15	2·88	0·74/1	164	—	" " "
G/3112	15/5/45	6·99	2·50	4·49	0·56/1	25	—	Determinations at intervals of a few days on a case with fever, splenomegaly, and anaemia, with some shifting dullness in flanks. Sternal puncture showed Leishman–Donovan bodies. Diagnosis therefore kala-azar
G/3112	20/5/45	7·04	2·35	4·69	0·5/1	17	—	

* This estimation was done at another hospital, and taken from the patient's notes.

the globulin normal or raised may therefore exert a lower osmotic pressure than a serum of equal or less total protein content but containing a higher proportion of albumin. Stitt gives the following figures as "normal": Total protein, 6.3–8.0%; albumin, 3.8–5.2%; globulin, 2.0–3.5%; A/G ratio, 1.45/1 to 2.2/1.

The total colloid osmotic pressure is said to lie between 20 and 30 mm. of mercury. Oedema is said to occur if the total protein falls below 5.5% or the albumin below 2.5%. It is clear from this that fractionation of the serum protein is required if the influence of the serum protein in determining the oedema is to be assessed.

Table II gives the results of a number of control determinations on sera of cases without anaemia or oedema. In Table III are given the corresponding figures for anaemic patients, some of whom were oedematous, and for one or two other cases with oedema and anaemia due to other causes.

It will be seen from Table III that Nos. 44131 and G/1419, though grossly anaemic and very ill, were free from oedema or ascites and had serum albumin levels well over 3.0%. No. 40866 on April 24, 1945, was grossly oedematous, and his total protein was very low, although his albumin was only just under 3% and his A/G ratio normal. A comparison of these three cases shows that the A/G ratio, taken alone, has no particular significance (see also No. 14404 in Table II, in which the A/G ratio is low because of increased globulin). No. N/22916 had moderate oedema and ascites on April 29. It was much worse on May 9, by May 30 it was improving, and it had disappeared by June 19. Two determinations on DN/22926 are included to illustrate a type of case in which oedema has long been accepted as being due to lowered serum protein; while G/3112, who had a little ascites, exemplifies yet another condition with a low albumin and a reversed A/G ratio.

The presence of oedema and ascites in these cases of anaemia has certainly given rise to errors in diagnosis. It often occurs at a stage when the anaemia is not impressive, and at which it may be missed altogether if reliance is placed on haemoglobin estimations alone. Two such cases were evacuated to this hospital with the diagnosis of hepatic cirrhosis, and in another vitamin B deficiency was suspected.

Aetiology and Complications

These are discussed together because I feel in a real difficulty of the "chicken and egg" variety. Certain conditions have been observed sometimes to accompany the anaemia, but whether they are also its cause is very difficult to determine. Table IV gives the conditions which were noted in this series.

TABLE IV.—*Conditions Present*

Ankylostomiasis	11*	Malaria	2*
Pulmonary complaints ..	9*	Scrub typhus	1
Amoebic dysentery	3	Schistosomiasis	1
Bacillary dysentery	1	None	12

*One patient suffered from malaria, ankylostomiasis, and a mild attack of pneumonia.

It will be seen that 12 of the cases suffered apparently from uncomplicated anaemia. Ankylostome ova were found in the stools of 11. In spite of the prevalence of dysentery, in only 4 of these cases was its presence established either during or before the onset of the anaemia. We can find no evidence suggesting that the anaemia was caused by dysentery; the diarrhoea from which many of them suffered was a feature of the anaemia itself, and was not caused by a bowel infection. In only two cases was the presence of malaria parasites established. (This raises a difficulty, because the majority of East African troops come from districts in which malaria is hyperendemic, and one would expect a higher parasite rate. On the other hand, they were all on suppressive mepacrine.) The proportion of respiratory complaints, varying from a mild bronchitis to frank pneumonia, was high. One patient was admitted with pneumonia and developed a macrocytic anaemia while in hospital.

Case DT/1574.—On admission (21/12/44): Temperature 103°, pulse 120, respirations 32. Crepitations at both apices; no frank consolidation. Not clinically anaemic. Given sulphapyridine.

26/12/44: T. normal; chest clear. Sulphapyridine stopped.

27/12/44: Moderate fever; looks pale. Hb 54%, R.B.C. 2,750,000, C.I. 0.99. Slight anisocytosis. W.B.C. 10,975 (P. 67%, E. 12%, L. 16%, M. 5%).

30/12/44. T. 100°. Weak and listless. Weil-Felix and Widal, negative.

5/1/45: R.B.C. 1,830,000, Hb 38%, C.I. 1.05. Anisocytosis, poikilocytosis, polychromasia; myeloblasts and normoblasts present; no sickling.

8/1/45: Put on high protein diet and vegemite.

21/1/45: Reticulocytes 5%.

23/1/45: Hb 82%, R.B.C. 4,630,000. Slight anisocytosis and poikilocytosis. W.B.C. 3,400.

26/1/45: Fractional test meal shows free HCl.

6/2/45: Hb 96%, R.B.C. 5,020,000, W.B.C. 4,100.

It is a pity that a red cell count was not done on admission. However, the blood counts of Dec. 27, 1944, and Jan. 5, 1945, illustrate the development of the anaemia. Large hypochromic red cells were present. The response of this case was particularly rapid. The impression gained from this and other cases is that though respiratory complaints do not cause the anaemia they may precipitate and exacerbate it.

That ankylostomiasis is potent in preventing recovery from anaemia was suggested by two cases in which ankylostomes were found and treatment was given soon after admission. After a time the anaemia failed to improve and further stool examination again revealed eggs. A second "worming" was followed by improvement in the blood count, and no more ova were seen. In face, however, of the number of cases in which neither ankylostomiasis nor any other disease was found, it is difficult to make a case for a causal relationship between the anaemia and any of the infections commonly seen in this theatre.

Of the total cases 31 were evacuated from forward areas, and 7 were admitted from L. of C. units. It is likely enough that the hardships of a particularly strenuous campaign would precipitate the condition in men already predisposed. But these figures may be misleading. At the time when almost all the sick and wounded from the East African Forces came through this hospital, all but a handful of troops were in forward areas. Later, when the division was out of the line, the bulk of the sick were diverted to another evacuation route, and were not seen here.

No apology is made for labouring the above points. In this, as in other instances, prevention is more important than cure. There is danger lest loose statement to the effect that anaemia is "always" due to malaria or ankylostomiasis may blind us to more important underlying conditions such as inadequate diet. In any case it is thoroughly established that the anaemia ordinarily caused by malaria and ankylostomiasis is characteristically of the microcytic type, and therefore different from that here described. To expect a man who has had a diet poor in first-class protein since he was weaned to maintain or replenish his haemoglobin in the face of hard campaigning conditions, with or without added infection, may be to expect him to make bricks without straw.

Treatment

Of this series one patient died from an intercurrent attack of cholera. Three were evacuated (when improving) because of pressure on hospital bed-space, and one was graded Category C on account of an old chronic synovitis of the knee. All the remainder have been returned to duty in Category A except five who are still under treatment. Some of those discharged still had achlorhydria, though three, originally achlorhydric, were found to secrete HCl when reviewed after return from the convalescent depot. Those with persistent achlorhydria all had normal blood counts, had put on weight, made no complaints of dyspepsia, and seemed so well that, rightly or wrongly, the finding was ignored and they were returned to duty. It seems, therefore, that the treatment given may be regarded as satisfactory in a long-term sense. But it has proved very slow: the average duration of treatment (including time at the convalescent depot) was 105 days; the longest 175 days, the shortest 58.

It is stated (Fairley and Low, 1939) that the condition responds to marmite, to liver, to liver extract by mouth equivalent to 1 lb. of liver a day, and to parenteral administration of liver extract. In the haemolytic type the doses of these substances may have to be very large. These authors say that before the introduction of liver therapy the mortality rate was around 40%. Moore, Vilter, Minnich, and Spies (1944), working on a series of cases in America, found that these

responded to parenteral liver and to beef muscle by mouth, and further showed that the following substances were without effect: niacin, thiamine, riboflavin, calcium pantothenate, pyridoxine, inositol, para-aminobenzoic acid, and choline.

In the present series the supply of therapeutic substances was too irregular to allow of more than a "shot-gun" regime of treatment. The diet contained about 4,000 calories. There were approximately 165 g. of protein, of which 38 g. were contained in meat (muscle), 22 g. in liver (when available), 31 g. in milk (including cheese), and 12 g. in eggs, giving 103 g. of first-class protein. (Anyone familiar with the supply position of the forward hospitals will realize that not infrequently one or more of these items were not available.) In addition, each patient received 2 to 4 oz. of vegemite (marmite substitute) and 9 multivite tablets per day. Each received an iron preparation twice daily, and for a time 2 oz. of dried yeast. For a considerable period no liver extract for injection was available, and that eventually supplied was of Indian manufacture and doubtful potency. A quantity of liver extract for oral administration was available for some time.

In all, eight patients received liver by injection. In two only was a reticulocyte response observed. Two patients showed a reticulocyte response on vegemite. Eight patients had one or more blood transfusions because of their precarious condition. Three of these were previously given at other hospitals. More would have been given at this hospital but for the difficulty of persuading East Africans to act as blood donors. However, several patients whose condition seemed very precarious, but from whom blood had to be withheld for the reason mentioned, made a good though slow recovery without it.

Treatment of Oedema and Ascites

Five of the oedematous patients received intravenous infusions of reconstituted serum. This treatment was followed by a diuresis, and in three cases the oedema and ascites began to clear up a few days later. In the other two it appeared to have little effect. It is felt that this line of treatment should perhaps have been followed more vigorously. The difficulty was, first, that the amount of serum available was limited, and a good supply had to be conserved for surgical emergencies; secondly, that the giving of serum was usually followed by a sharp rise of temperature and a good deal of malaise and discomfort. The water used to dissolve it had been bottled for some time, and one would have felt happier in preparing fresh pyrogen-free water; no glass still was, however, available. A pint of serum will contain about 40 g. of protein, of which about 22 g. will be albumin; this would raise the serum albumin by about 0.5%.

In the presence of a large effusion the question of paracentesis arises. The fluid contains protein which is for the time being out of circulation, though if the effusion is naturally absorbed it will presumably become "current coin" again. If, however, part of it is removed by paracentesis, and is replaced again (as so often happens) by further effusion, protein will be irrevocably lost to the body. As an example, on May 28, 1945, 2,570 c.cm.—a very small part of a huge ascites—was removed from the abdomen of No. 40866. This contained 93 g. of protein, of which 40 g. was albumin. The removal of this fluid made little difference to his comfort, and in a few days he was as distended as before. Subsequently (June 19) the oedema and ascites began to diminish, and had all disappeared in a few days. Earlier, N/22916 had had 3,640 c.cm. withdrawn at the cost of 32 g. of protein (which in this case was all globulin). He "filled up" again very quickly. Subsequently the whole effusion was absorbed. It is thought that, unless really serious embarrassment is being caused, effusions in these cases are better left alone.

Conclusion

In writing this imperfect account I have made use of some data—e.g., the first figure in Table III—contained in the documents of patients transferred from other hospitals, and, in certain cases, of the notes of other M.O.s (particularly those of Capt. R. A. Shanks, R.A.M.C., of this hospital). I am greatly indebted to Major A. B. Raper and his staff, especially S/Sgt. M. Fitch, R.A.M.C., for all the haematological examinations, for routine pathological examinations, and for facilities for carrying out the serum protein determinations.

Summary

A brief account is given of 38 cases of tropical (or nutritional) macrocytic anaemia among East African troops. The aetiology of the condition in S.E.A.C. is discussed.

Particular attention is paid to the occurrence of oedema and effusions. They were observed in nearly 30% of cases, and appear to coincide with the regeneration of red cells rather than with the acute stage of the disease.

A number of estimations of serum protein have been performed. Their significance is discussed.

APPENDIX

The method used for serum protein determination was based on that of Walther (1941) for total serum of plasma protein. 0.02 c.cm. of serum of plasma (measured by means of a haemoglobinometer pipette) is digested with 0.25 c.cm. of sulphuric acid and 0.5 c.cm. of saturated potassium persulphate. The digested mixture is made up to 40 c.cm., nesslerized directly, and compared in a colorimeter against standard ammonium sulphate solution. In the original method a standard correction is applied for non-protein nitrogen, since it is estimated along with the protein nitrogen. In this work boiling-tubes, a spirit lamp, sulphuric acid, persulphate, and Nessler's solution were available, and the laboratory still fortunately yielded ammonia-free water. There was, however, no colorimeter. Fortunately, the commanding officer had brought with him a Lovibond tintometer, and the 0–100 mg. blood-urea disk. These disks are, of course, made for use under the precise conditions laid down by the makers and with Nessler's solution made to a certain formula. These conditions could not be fulfilled, so urea, dried in an improvised desiccator, was weighed out, dissolved, and the solution containing known amounts of urea treated exactly as the serum would be, and used to standardize the disk in terms of mg. of nitrogen per c.cm.

The serum total nitrogen was then determined as described by Walther. After digestion the volume was made up to 25 c.cm. and the nitrogen estimated in the comparator. Dilution, which was achieved by mixing the digest with ammonia-free water in the comparator tube, keeping the final volume 5 c.cm., was carried out if required.

Non-protein nitrogen was estimated by mixing 2 c.cm. of serum, 2 c.cm. of distilled water, and 2 c.cm. of 10% trichloracetic acid, filtering, and digesting 1 c.cm. of the filtrate with 0.1 c.cm. of sulphuric acid and 0.2 c.cm. of persulphate, and making the final volume 10 c.cm. Nesslerization and comparison were carried out as described above. This is not very satisfactory: the colour comparison is often hindered by cloudiness in the tube, due probably to the precipitation of inorganic phosphate. If, on the other hand, this is avoided by greater dilution, the colours (with normal N.P.N. levels) become too pale to be read. With this procedure, of course, the amount of filtrate digested is equivalent to 1/3 c.cm. of serum, instead of 1/50, which is used in the method for total protein. Fortunately, the protein equivalent of the N.P.N. is small, and the inaccuracy involved is not material.

It is worth noting that if the N.P.N. is high the difficulties mentioned disappear, since greater dilution can be used, and the method is then a quick and accurate one (e.g., Table III, No. DN/22926).

The fractionation of albumin and globulin was carried out on the usual principles: 0.2 c.cm. of serum was mixed with 6 c.cm. of 22% sodium sulphate (which was stored in the incubator) and the mixture allowed to stand at 37° C. No filter paper fine enough to filter off the precipitate was available, but by careful pipetting sufficient clear supernatant fluid could be obtained to carry out protein determinations, 1 c.cm. of fluid (equivalent to 1/31 c.cm. of serum) being digested as before. The blank tube contained appropriate amounts of sodium sulphate, sulphuric acid, and potassium persulphate. The result represented albumin nitrogen + N.P.N. The albumin was calculated from this and the globulin obtained from the figure for total protein by difference. All determinations were made in duplicate. Unless the duplicates were in good agreement they were repeated.

It will be appreciated that these methods were used from necessity, not from choice. The employment of so little as 0.02 c.cm. of serum implies an enormous dilution factor and a corresponding exaggeration of random errors. Distillation after digestion is always preferable to direct nesslerization, because of the presence of interfering substances. The lack of a colorimeter was a very severe handicap.

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SULPHAEMOGLOBINAEMIA DUE TO ANILINE DERIVATIVES

BY

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The continued use of aniline compounds may produce a marked and persistent cyanosis due to the formation of sulphaemoglobin in the red blood corpuscles. Attention has been directed in recent years to the frequency with which sulphonamide therapy is associated with sulphaemoglobinaemia, but the power of the humbler aniline antipyretics in this direction does not appear to be so well appreciated. Snapper (1925) described two cases of sulphaemoglobinaemia which were due to the continued use of aniline antipyretics. Similar cases have been described by Harrop and Waterfield (1930), Healy (1933), and Morgan and Anderson (1940), among others.

The toxicity of the different members of the aniline antipyretic group varies. The relative toxicity of acetanilide is high, and most of the reported cases of sulphaemoglobinaemia precipitated by aniline antipyretics have been due to that drug. Addiction to it has been observed, and this danger has been emphasized by a number of observers. Acetanilide is now included in Part I of the Poisons List (1937), is not easily available to the public, and hence widespread abuse of it is not to be expected.

Phenacetin presents a quite different problem. It is a component of numerous proprietary headache powders and can be obtained without difficulty. Its chemical structure is similar to that of acetanilide; it is less toxic, however, and cases of chronic poisoning by phenacetin are therefore seldom encountered. In large doses it can, as might be expected, produce poisoning, with effects, including sulphaemoglobinaemia, very much like those seen with acetanilide. Snapper's (1925) two cases of sulphaemoglobinaemia were due to chronic poisoning with phenacetin, and Coxon and Crawford (1940) have reported another. Two cases of sulphaemoglobinaemia have been seen recently, and are described here.

Case I

On April 6, 1943, a housewife aged 42 was admitted to hospital on account of severe headache, weakness, and cyanosis. She had been subject to attacks of severe headache since childhood. These attacks occurred at least once a week and each lasted one to two days. Since the menopause in 1941 the severity and duration of the headaches had increased. The pain began in the crown of the head and then spread to one or other side. The patient could not account for the headaches; she read avidly without ill effect, and was free of nausea and photophobia during the attacks. She shunned company and crowded places, as she feared that an attack might be precipitated in these circumstances. In 1930 she received numerous injections of morphine to ease the headaches. Eighteen months before admission she had noted that her lips were blue, and she stated that her skin had been blue for about a year. This blueness was more pronounced during attacks of headache, and the patient's relatives had remarked on the blue colour of her face. She had taken many brands of analgesic powders for her headaches, but two years before admission she resorted to a proprietary tablet (phensic) which contains approximately 3.6 gr. of acetylsalicylic acid and 2.1 gr. of phenacetin. She took between "4 and 10 tablets daily," according to the severity of the headache. During an attack of pain she had had as many as 30 tablets in a day (=63 gr. of phenacetin).

Her husband stated that in the last attack, which persisted for four days before admission, his wife had taken over 100 tablets. He said that the patient had become very irritable and depressed during the past few months. She was confused when the headaches were severe and kept swallowing tablets without regard to their number. During the past year she had been given 4½ gr. of ferrous sulphate daily and monthly injections of anahaemin, presumably to improve her general condition.

On admission the patient was greatly distressed with headache, but not confused. She was thin and poorly nourished. There was no dyspnoea, but cyanosis was very marked. The skin was a slate-grey colour, which was especially noticeable in the lips, ears, nose, and beds of the nails. The temperature was 99° F., the pulse rate 100, and the respiratory rate 20 a minute. The pulse was regular and of good volume: the arterial wall was not palpable. The area of cardiac dullness was not increased and the heart sounds were well heard. A systolic murmur audible at the mitral area was not conducted. The chest was symmetrical and moved equally on both sides. Further examination did not reveal any abnormality of the lungs. There was no evidence of any mediastinal abnormality. The abdomen was tense, but moved freely with respiration. The liver and spleen were not palpable. Examination of the nervous system did not reveal any abnormality. The optic fundi were normal. The urine was free of albumin, sugar, and blood, but showed the "diacetic acid fallacy" with ferric chloride solution.

Blood examination showed: Hb, 105% (Sahli); red cells, 4,800,000 per c.mm.; white cells, 4,200 per c.mm. The blood films were normal. The venous blood was darker than normal and remained so despite shaking in air. On spectroscopic examination of lysed blood an absorption band was seen in the red portion (612-620 λ) of the spectrum. This band was not affected by the addition of potassium cyanide solution and was presumed to be due to sulphaemoglobin. It was visible in a 1 in 100 dilution of blood in water two days after admission (April 8). No specific treatment was given. The headaches were considered to be psychogenic in type.

Progress.—The acute headache passed off after three days, but the cyanosis remained. Analgesics were withheld, and so far as is known the patient did not have a secret supply. Despite this, it was 16 days before there was any obvious diminution in the cyanosis. Three weeks after admission the cyanosis had lessened considerably, but the sulphaemoglobin absorption band was still present in a 1 in 18 dilution of venous blood. The patient was discharged after four weeks.

Six weeks after admission (May 21) the cyanosis had almost disappeared, although the sulphaemoglobin band was still detectable in a 1 in 12 dilution of the blood. Blood examination showed: Hb, 70% (Sahli); red cells, 4,800,000; white cells, 6,500 per c.mm. On June 11—i.e., just over eight weeks after withdrawal of the tablets—spectroscopic examination of the blood failed to reveal a sulphaemoglobin band. The general skin cyanosis had gone, but the lips were still dusky. Reviewing this case, we may conclude that the regular ingestion of phenacetin (8–20 gr. daily) over a period of two years had led to the formation of sulphaemoglobin in the blood.

Case II

A baker aged 57 was seen as an out-patient on July 10, 1943. He had had severe pain in the left shoulder during the previous three weeks. The onset of the pain had been sudden and some improvement had occurred with local counterirritant measures and analgesic powders. There was no dyspnoea.

The patient was a cheerful well-built man. Marked cyanosis, of blue-grey colour, was seen in the lips, face, ears, and especially in the nail-beds. Systemic examination did not show any further abnormality. In particular, there was no evidence of any upset of the respiratory and cardiovascular systems. Blood films were normal: Hb, 95% (Sahli); red cells, 4,250,000 per c.mm.; white cells, 7,800 per c.mm. The urine appeared to be normal on chemical examination. Rheumatic myalgia of the left deltoid muscle was found to be responsible for the pain; it responded to massage.

The analgesic powders prescribed by the patient's doctor contained 10 gr. of phenacetin and 5 gr. of acetanilide. Twelve powders were taken each week. Thus when first seen he had had a total of 240 gr. of phenacetin and 120 gr. of acetanilide in two weeks.

On being questioned he stated that the blue colour of his face had been noted by his relatives for a week and that it had caused them some concern, as they feared it was due to "heart trouble." The venous blood was darker than normal, having a chocolate tinge, and an absorption band in the red was found on spectroscopic examination. This band was not affected by potassium cyanide solution, and it was thought to be due to sulphaemoglobin. The band was easily detected in a 1 in 65 dilution of the blood.

No more powders were given, and the patient made an uninterrupted recovery. As is usual in sulphaemoglobinaemia, the cyanosis lifted slowly. Thus, one week later (July 17) cyanosis was still present and the sulphaemoglobin band was detected spectroscopically in a 1 in 30 dilution of venous blood. Two weeks later (July 24) the cyanosis was definitely less marked. The patient resumed his employment and did not return for further observation.

Both acetanilide and phenacetin had been taken in this case, and both may have contributed to the formation of the sulphaemoglobin. However, acetanilide, because of its greater toxicity, must be held largely responsible. No treatment of the cyanosis was given apart from withdrawal of the drugs. Long and Spriggs (1918) noted that inhalations of carbon dioxide and oxygen improved their cases of sulphaemoglobinaemia. Healy (1933) gave carbon dioxide and oxygen inhalations, together with a high-fat diet and ammonium chloride, to two cases of sulphaemoglobinaemia, and reported that the cyanosis disappeared within a week.

Discussion

Apart from the different drugs involved, these two cases of sulphaemoglobinaemia may be taken as examples of two clinical types in which cyanosis due to aniline antipyretics can occur. Case I is an example of the entity called "enterogenous

cyanosis." The salient features here are psychological instability, weakness, chronic headache, and cyanosis without associated dyspnoea, occurring almost exclusively in women. While it is just possible that some of these cases may be idiopathic, it is now recognized that the majority are due to the ingestion of aniline antipyretics. The self-administration of drugs is often denied by these patients, and careful search may be necessary to find the actual cause of the sulphaemoglobinaemia. Case I suffered a relapse some months after dismissal. This patient was admitted to another hospital and a normal ventricular system was demonstrated by cisternal encephalography. She was then examined by a psychologist, who reported that the symptoms were psychological in origin. Case II presents many different features. Here the drugs were taken to obtain relief from pain caused by an organic condition. The pain of rheumatoid arthritis, as in the case reported by Coxon and Crawford (1940), or of rheumatic myalgia as in the case here described, may be the prime factor. Both sexes may be affected, psychological instability is not present, and the tendency to habit formation is not marked.

The mode of formation of sulphaemoglobin is the same whether it is produced by aniline itself or one of its derivatives. According to Snapper (1925), the circulating haemoglobin is sensitized by aniline derivatives and can thus unite with traces of sulphide absorbed from the intestine. Snapper induced sulphaemoglobinaemia in men by administering aniline compounds and sulphur. Outside the body, however, aniline and its related compounds have no effect on haemoglobin. It appears that aniline compounds are oxidized to the corresponding phenyl-hydroxyl amines and *p*-aminophenols in the blood stream and that these substances affect haemoglobin. Gley (1937) and Morgan and Anderson (1940) have demonstrated that both these substances, when added to blood, lead to the rapid formation of sulphaemoglobin if a trace of sulphide be present, and to methaemoglobin if sulphide be absent. Methaemoglobin can be produced only with difficulty by giving aniline antipyretics alone (Harrop and Waterfield, 1930). Further, methaemoglobin is highly unstable in the blood stream, being rapidly converted to haemoglobin (Stadie, 1921), and large quantities are required to produce cyanosis. Such cyanosis lifts within 24 to 48 hours after withdrawal of the drug, and is more likely to appear in acute than in chronic poisoning.

Finally, there is some evidence in favour of the view that coloured oxidation products of *p*-aminophenol are present in the blood after the ingestion of aniline compounds and that these are partly responsible for the cyanosis. Leslie (1939) described a case of acute acetanilide poisoning in which marked cyanosis was not associated with any change in the blood pigment and was considered to be due to the presence of some coloured derivative of acetanilide in the blood. Lundsteen, Meulengracht, and Rischel (1938) described 11 cases of chronic acetanilide poisoning with cyanosis, and were able to demonstrate a chocolate-coloured derivative of *p*-aminophenol in the blood of one of their cases which was specially investigated. It is difficult, at present, to assess the importance of this coloured *p*-aminophenol derivative in the production of cyanosis. In the majority of cases of chronic poisoning with aniline antipyretics, including the two described here, the cyanosis has been adequately, if not completely, accounted for by the presence of sulphaemoglobin in the blood.

Summary

The clinical and laboratory findings in two cases of sulphaemoglobinaemia due to aniline antipyretics are described. The method of formation of the abnormal pigment and other factors which may contribute to the cyanosis are discussed.

I wish to express my indebtedness to Dr. John Gracie for permission to investigate cases under his care, and to Drs. S. V. Telfer and G. H. Bell for their advice and help.

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THE CHILD WITH FREQUENT COLDS

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In this article are given the results of a comprehensive investigation of 100 school-children suffering from frequent colds. At the invitation of the County Medical Officer, the children were referred by the school medical inspectors in the area of South-West Essex to a special clinic established at the hospital for the purpose of investigating this prevalent condition. The children were mostly drawn from middle-class and artisan families. The main part of the investigation consisted of clinical, *x*-ray, and laboratory examinations, and note was also taken of the environment and development of the children. While our chief purpose was to establish the clinical characteristics of the child with frequent colds, we also considered the problem of which department in a hospital should be responsible for their examination and should advise on their treatment.

It was inevitable that a number of children suffering from asthma and hay-fever should be referred to such a clinic. If these are excluded the history of the disorder is a typical one. The children usually began to suffer from frequent colds when they started attendance at school. They complained at first of blockage of the nasal passages followed by a mucous discharge which after a few days became muco-purulent. Often there was also a mild upper respiratory infection, with slight cough but little sputum. The general constitutional disturbances always found in an adult suffering from coryza were absent. The cold will last about two weeks, and then the child may be free for a few weeks until the next attack. This cycle will continue right through the winter and may often be present during the summer months, though the colds are usually less severe in the warm weather. In a small number of cases there was continuous muco-purulent nasal discharge between the attacks. Many of these children had had these frequent colds for as long as three years. While the children remain fairly well in spite of these frequent attacks, both the parents and the education authorities show concern at the amount of schooling lost. Some parents are also anxious lest the frequency of the attacks denotes some constitutional deficiency or even serious organic disease—e.g., tuberculosis.

We have examined 130 children, the findings in the first 100 of which are given below. There were 59 boys and 41 girls in this series. Four children were between the ages of 1 and 5, 69 between 6 and 10, and 27 between 11 and 15 years.

History

Their birth weights were all within normal limits, and they all developed normally from birth, reaching the usual milestones at the expected ages; 88 had been breast-fed and 12 bottle-fed; and 95 were given cod-liver oil and orange juice or other additional vitamins to supplement a normal diet. Only 2 children were in the habit of going to bed late. We analysed this series with regard to previous infectious diseases and found that 84 had had measles, 59 whooping-cough, 3 diphtheria, 59 bronchitis, 23 tonsillitis, and 14 otitis media. The majority of them had been vaccinated and immunized against diphtheria. No definite relation was found between any of these infectious diseases and the onset of colds. In 33 cases the mothers complained that their children snored at night and were mouth-breathers. Twenty-one children had had their tonsils and adenoids removed before being seen by us, mainly for the relief of frequent colds, and of these 18 were not improved. A near relative of 26 children had suffered from tuberculosis and of 22 from an allergic condition.

Clinical Examination

These children all showed normal weights and heights for their age and sex, and appeared to be well developed and of normal intelligence, with the exception of 3 who were slightly

backward. None showed evidence of rickets. Their temperatures, pulse, and respiration rates were normal. Eight had carious teeth. Tonsillar enlargement of varying degrees was present in 39 and the adenoids were prominent in 27. In no case was there complete nasal obstruction, and the adenoid facies was rare. We specially observed the shape of the thorax of these children, and found that in 17 it was definitely barrel-shaped, in 5 alar, and normal in 78. In no case was serious lung disease found, but 8 showed a few scattered rhonchi and occasional rales. The heart, abdomen, and central nervous system were normal in all cases. No serious organic disease was therefore found on clinical examination.

Investigations

A number of laboratory tests were done on every child. The haemoglobin in 2 cases was between 60 and 70%, in 6 between 71 and 80%, in 45 between 81 and 90%, in 16 between 91 and 95%, and in 31 over 95%. The white count was between 6,000 and 10,000, and in no case was there a leucocytosis. The differential count showed some interesting features. Only 3 had increased eosinophils, but there were more than 40% of lymphocytes in 53 of the patients, showing a relative lymphocytosis. The urine was normal in every child. B.S.R. (Westergren) was done in one-third of the children, and was within normal limits. Twelve children had a positive Mantoux (1:1000), and 5 of these had positive family histories. None of them showed any other evidence of tuberculous infection, and there was no relation between the positive Mantoux reaction and anaemia or frequent colds. *X*-ray examination of their chests showed mild catarrhal changes in 49, particularly in the right lower zone, and also slight increase in the hilar markings. Skiagrams of their sinuses showed definite opacities in one or both maxillary antra in 51, and this was the most common abnormality found in the investigations done on these children. The radiographic appearances were thought to be due to mucosal swelling and thickening in the majority of cases, and only 3 showed opacities thought to be caused by actual pus in the sinuses.

Each child was also tested for allergic skin sensitivity to the common air-borne inhalants by the intradermal method, and to the pollens and the main food groups by the scratch test. In all, 14 groups covering 60 substances were used. No food sensitivity was discovered in any child. Eleven children showed positive reactions; 4 of these were cases of hay-fever and had marked sensitivity to pollens, and 5 were cases of bronchial asthma showing marked sensitivity to air-borne inhalants, those most frequently incriminated being house dust, feathers, horse dander, cat, dog, cow, wool, and furs, in that order. The remaining 2 cases gave positive skin reactions to air-borne inhalants, but the symptoms for which they had been referred were not regarded as allergic. The skin-testing was done independently of the history-taking and clinical examination, and therefore any bias in its interpretation can be excluded. It is interesting that in every case where an allergic factor was diagnosed it was confirmed by skin tests. At the clinic at this hospital for children suffering from respiratory allergy, in which skin sensitivity tests are done, 80% show positive reactions. This is in marked contrast to the present series, only 11% of which had positive skin reactions to the common air-borne inhalants. Two other features distinguishing the two groups are the absence of radiological abnormality of the nasal air sinuses in the allergic group and the low incidence of eosinophilia in the present series as opposed to the allergic.

The cervical, axillary, and inguinal groups of glands were carefully examined, and enlargement of the cervical chain of glands was noted in 30 cases. This was usually found in patients with enlarged septic tonsils. In addition, however, many children showed enlargement, sometimes to a considerable extent, of the other groups of lymph glands. This generalized glandular enlargement seems to be common in children who have an active septic or tuberculous focus, though often no obvious cause can be found. Twenty children with adenopathy had several additional investigations done to see whether further light could be thrown on this clinical problem—namely, the Paul–Bunnell test, Wassermann reaction, and biopsy of a small gland in 6 cases. All these tests proved negative, and the results of the routine investigations in no way differed from those obtained in children with no generalized glandular enlargement. The glands studied histologically showed activity only in the germinal centres, and the general structure of the gland was quite normal.

No bacteriological examination of the muco-purulent nasal discharge was made. Many workers have investigated its flora and the results are well known.

Conclusions

From these investigations we learn that the child with frequent colds is of normal development, build, and intelligence, and does not suffer from any other organic disease. Though minor degrees of anaemia occur, the children cannot be regarded as physically defective. The onset of the attacks at the beginning of school suggests that the continuous contact with infection is an important aetiological factor. No definite relation was found between the colds and developmental abnormalities, upbringing, previous illnesses, or contact with tuberculous infection. No conclusion can be drawn from the lack of improvement after tonsillectomy, as naturally the children who improved after this operation would not be sent to the clinic; but we believe that in the absence of other indications, such as infection of the tonsils or nasal obstruction due to adenoids, surgical removal of the tonsils and adenoids will be relatively ineffective as a measure designed to prevent frequent colds. No allergic aetiological factor could be established. Investigation of the blood, the Mantoux test, and special investigations with regard to glandular enlargement, though of general interest, did not throw any light on this condition. These frequent colds are due to inflammatory reactions of the mucous membrane lining the nasal passages and air sinuses, and give rise to few general constitutional disturbances in children. A filterable air-borne virus seems to be responsible, aided by other organisms such as the pneumococcus, *Str. viridans* and *haemolyticus*, staphylococcus, *Micrococcus catarrhalis*, or *Haemophilus influenzae*, which set up secondary infection. Repeated colds may cause nasal obstruction, and there may be arrest of nasal development and failure of muscular control over nasal respiration. These factors predispose the child to further infection.

We think that the treatment of this condition is entirely a problem for the ear-nose-and-throat surgeon, who should keep these children under supervision in a special clinic where they can receive conservative and operative treatment. A general medical or surgical, paediatric, or allergic clinic should not have to deal with these children, as, apart from the local conditions affecting the nasal passages, sinuses, and throat, no other abnormality could be discovered.

We wish to acknowledge our indebtedness to the County Medical Officer, Dr. W. A. Bullough, for his interest and co-operation in the investigation, and for permission to publish the results.

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Dr. Douglas Lothian, resident medical superintendent of the Down Mental Hospital, Downpatrick, in his report for 1944 records that 39 patients were treated by the electro-convulsive method during the year, and 9 of them were discharged recovered, 3 being cases of dementia praecox and 6 suffering from depression. Two other cases of depression made such considerable improvement as to warrant the expectation that they would soon be discharged, as did 1 case of dementia praecox. Three cases of dementia praecox made an apparent recovery, but relapsed later; 2 cases made some improvement, but relapsed completely later. Forty-seven patients recovered without electro-convulsive therapy, but with psychotherapy and occupational therapy; these included 18 cases of dementia praecox, 16 depressions, 7 anxiety neuroses, 5 manias, and 1 paraphrenia. The other recoveries included a case of general paralysis of the insane treated by trypars-amide and bismuth, 2 cases of arteriosclerotic confusion cleared up by careful attention to living habits, 1 case of uraemic confusion, and 2 cases of mental disorder resulting from alcoholism.

MASS MINIATURE RADIOGRAPHY OF FACTORY GROUPS IN MIDDLESEX

BY

W. POINTON DICK, M.R.C.S., L.R.C.P.

Physician to the M.C.C. Mass X-ray Unit

The Middlesex County Council Mass Radiography Unit took *x*-ray films of its first volunteer on Oct. 11, 1943, and to July, 1945, had examined over 70,000 persons, their ages ranging from 12 to 76 years. This report is confined to a survey of the work of the unit during the year 1944, with the exception of the age groupings of examinees and significant lesions, which are for the period Oct., 1943, to June, 1944. During 1944 ten factories were visited, their population ranging from 1,050 to 4,608. Neighbouring factories were invited to attend at most of these centres, so that the actual number of examinees varied between 706 and 9,640. Using the present set-up and the routine to be described below, it has been found to be uneconomic, from the point of view of time, to visit groups of fewer than 3,000. The response varied between 73 and 93% for inside groups, but fell to as low as 36% for some of the visiting factories. This was readily accounted for by the extra loss of working time when any considerable journey had to be made. The average period away from the work for an "inside" examinee was 15 minutes, and the unit has received letters from several firms stating that there was no appreciable loss in production time during its visit to their factory.

In a normal working week miniature films are taken on Monday, Tuesday, and Wednesday, and large films on Thursday. Friday is devoted to viewing miniatures, reporting on large films, and general clerical work. An average of 450 to 500 miniature films are taken daily, and as 500 is the maximum that can be satisfactorily viewed at any one sitting it is necessary to hold three viewing sessions weekly. During the first week of a visit there are four full days for miniatures, making a weekly total of 1,800 to 2,000, and the viewing sessions are correspondingly increased.

On Friday is completed the list of those persons required to attend for large films on the following Thursday. At one time it was the practice to send out the recall letters to their home addresses. In order to be sure of their receiving them in time it was necessary to post the letters a few days before the examinees were required to attend. We found that this period of waiting caused considerable anxiety and the development of not a few symptoms. To obviate this, examinees are now notified, where possible, by a note handed to them at their work an hour or so before their large film is due to be taken. Finally all persons who have a large film have a medical interview, including a discussion on their wet film, shortly after it is taken. In this way, by the time they return home from their work the whole procedure is completed.

Analysis of Results

The total number of examinees during 1944 was 34,227, comprising 19,609 males and 14,618 females. It has been impossible to date to set these out in age groups, but this has been done for the 20,982 persons examined by the unit during the period Oct., 1943, to June, 1944, and these are shown in Table I.

TABLE I.—*Age Groups of Examinees*

Age:	14–24	25–34	35–44	45–54	55+	Total All Ages
M ..	1,758* (14·6%)	3,658 (30·4%)	4,262 (35·5%)	1,610 (13·4%)	722 (6·0%)	12,010
F ..	3,680 (41·0%)	2,711 (30·2%)	1,718 (19·1%)	695 (7·7%)	168 (1·9%)	8,972

* It may be noted in regard to the small number in this group that in a paper by Trail *et al.* (1944) reporting a survey in the Royal Air Force 70% of the male examinees were in the 17–24 age group and that the incidence of active pulmonary tuberculosis among them was 0·3%.

Refusals.—It was possible to analyse the refusals by 682 persons from two factories with a total available population of 5,930. The result is given in Table II.

TABLE II.—*Analysis of Refusals by 682 Persons*

Age	Men		Women	
	Available	Refusals	Available	Refusals
14–34 ..	1,177	67 (5·7%)	2,167	165 (7·6%)
35+ ..	1,469	260 (17·7%)	1,117	190 (17·0%)

A further factory (Factory A of the Medical Research Council Report on Mass Radiography of Civilians) has been visited at yearly intervals, first by the M.R.C. and subsequently by this unit. It is of interest that out of 148 persons at this factory who refused in 1943 but who were *x*-rayed in 1944, and a further 214 who while refusing in 1944 attended for examination in 1945, there was not one who showed any evidence of pulmonary tuberculosis.

There were 1,909 examinees recalled for a large film in 1944, giving a recall figure of 5.6%. Of these, 50—that is, 2.6% of those recalled—did not attend for their large film. As would be expected, the number of defaulters was always higher in the outside groups, averaging 3.7%, compared with 1.6% for the main factories. There were a further 36 who, having had a large film and on interview been recommended to attend a chest clinic, failed to do so. Of those who attended a chest clinic 1.5% were reported as requiring no further action.

Abnormalities Found

The abnormalities discovered among the 34,227 persons examined by the unit during 1944 are listed below. They are divided into tuberculous and non-tuberculous groupings. Cardiovascular lesions predominated in the latter, and it is of considerable interest that the great majority of these patients were already aware of their disability.

A. Non-tuberculous Pathological Conditions

Cardiovascular	157 (0·5%)
Congenital 12; acquired 145 (86% already knew of their condition)	
Tumours	15
Bronchiectasis	31
Lung abscess	2
Pneumoconiosis	33
Pneumonitis	10
Bronchitis and emphysema	104
Pleural thickening	569*
Miscellaneous	158

* Some of these were almost certainly of tuberculous origin.

B. With Evidence of Pulmonary Tuberculosis, including Healed Lesions (1,435 Cases)

(1) Known cases	140
(Improved or no change, 130; relapsed, 10)	
(2) Newly discovered:	
(*a*) Requiring no further action	861 (2·5%)
(Including 537 healed primaries)	
(*b*) Showing significant lesions	434 (1·3%)

C. Analysis of Significant Lesions

(*a*) Extent of disease:	
Unilateral	275 (63·4%)
Bilateral	159 (36·6%)
(*b*) Disposal:	
Observation	346 (1·0%)
10·8% of these were put on modified work	
Treatment	88 (0·3%)

(*c*) Presence of symptoms (Table III):

TABLE III

Disposal	With Symptoms	Symptom-free	Total
Observation	105 (32·0%)	241 (68·0%)	346
Treatment	46 (52·3%)	42 (47·7%)	88

(*d*) Sputum results in the 88 treatment cases:

None	34
Negative	32
Positive	22

(*e*) Age groups of significant lesions found in first 20,982 examinees (Oct. 1943–June 12, 1944) (Table IV):

TABLE IV

Age:	14–24	25–34	35–44	45–54	55+	Total All Ages
M ..	14 (0·8%)	40 (1·1%)	59 (1·4%)	27 (1·7%)	8 (1·1%)	148 (1·2%)
F ..	42 (1·1%)	38 (1·4%)	20 (1·2%)	6 (0·9%)	1 (0·6%)	107 (1·2%)

Comments

If the population of Middlesex be taken as 2,000,000 it can be calculated that there are approximately 1,200,000 persons in the 14–55 age group. Allowing that the age distribution of the females in the above survey is very skew, being excessively overweighted at ages 14–24, it appears that there are probably some 3,000 undiagnosed cases of pulmonary tuberculosis in the county in need of treatment, and that half of these cases are without symptoms.

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A CASE OF LEFT-SIDED APPENDICITIS

BY

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Although left-sided appendix is by no means rare, the following case is interesting in that a full examination was possible later in the post-mortem room and an unusual condition found.

Case Report

A soldier aged 19, three months convalescent from a subtotal thyroidectomy for Graves's disease, was admitted to hospital on March 21, 1945. He was in a very nervous and toxic state, and gave a history of severe abdominal pain, which had started suddenly 36 hours previously and become progressively worse. The pain was continuous in character, and was at first generalized and was accompanied by nausea, but had since become localized to the hypogastrium and medial side of the right iliac fossa; he had vomited twice just before admission. There was no history of dysuria, and the bowel actions had been normal. Previous history did not give any indication of gastro-intestinal disease.

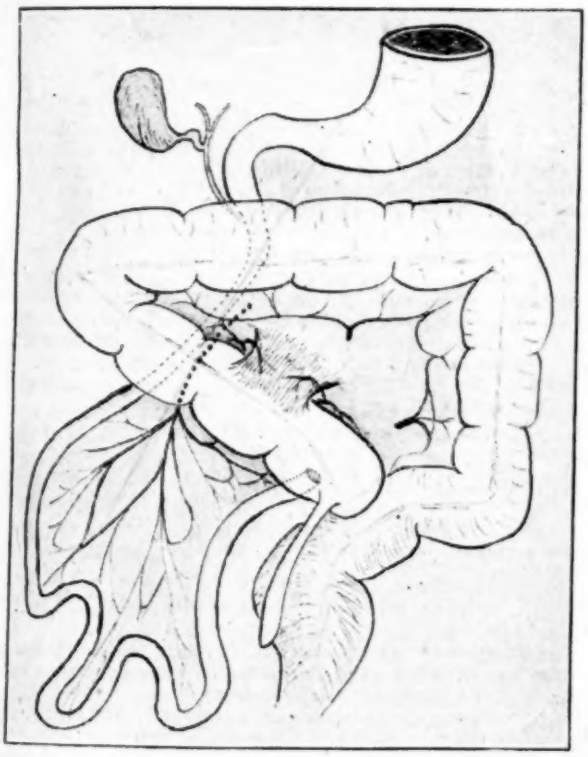

Diagram showing the abnormal position of the abdominal viscera, with the restrictive band.

Abdominal examination showed slight distension, with rigidity over the whole lower half of the abdomen; and acute tenderness localized to the hypogastrium and right iliac region. Auscultation revealed a "silent abdomen." Per rectum, he was tender anteriorly, high up. His general state was poor, with dehydration and a rapid pulse which showed occasional extrasystoles. A diagnosis of early diffuse peritonitis, secondary to a perforated inflamed appendix, was made, and operation arranged accordingly.

Operation.—The abdomen was opened through a right gridiron incision as there was no clinical indication of an abnormal situation of the appendix, and purulent fluid escaped. On inspection neither the appendix nor the caecum could be seen, and their absence was confirmed by finger exploration—the right iliac fossa being apparently filled with distended coils of small gut only. The incision was closed and replaced by a right lower paramedian incision; this revealed a long gangrenous appendix lying obliquely across the left lower abdomen, from left to right, with the tip reaching the recto-vesical pouch. The caecum was occupying the left iliac fossa, together with the sigmoid colon, and it was ascertained that the liver was in its normal situation; but, apart from this, no further exploration was attempted, in view of the patient's critical state, and appendicectomy with suprapubic pelvic drainage was carried out. Intravenous infusion was started, and an attempt was made to institute continuous duodenal suction; but the man proved most intractable and refused to tolerate either form of treatment, repeatedly pulling out both Ryle's tube and intravenous cannulae.

He became progressively worse, developing paralytic ileus and dying on the fifth day. Permission for a "limited" necropsy was granted.

Post-mortem Findings.—On opening the abdomen the small bowel was found to be entirely confined to the right side, with the caecum and ascending and descending colons occupying the left. The ascending colon passed obliquely upwards and to the right to join the transverse colon at a normally situated hepatic flexure, the ascending colon being maintained in its abnormal site by a thick band, 2½ in. broad, between its middle third on the left side and the transverse mesocolon. The appendix arose from the right side of the caecum, and the ileum entered it towards the right side on its postero-lateral aspect. The jejunum started at its junction with a vertically descending third part of the duodenum, on the right-hand side of the superior mesenteric artery. No other congenital abnormalities were found. (See Diagram.)

Commentary

I could not find any evidence of inflammatory adhesions, and there were no enlarged or calcified mesenteric glands, so it must be presumed that the band from the ascending colon was of congenital origin; further close inspection of the band showed fairly large vessels coursing in its substance, derived from the right colic artery and distributed to the colon, suggesting that it was a contracted right mesocolon.

A so-called "wandering caecum," due to excessive rotation of an unduly mobile caecum, was excluded by the position of the appendix and ileo-caecal valve on its right side; and further proof of the congenital origin of the condition was supplied by the abnormal site of the duodeno-jejunal flexure to the right of the superior mesenteric artery.

From these findings it is suggested that the case described is a failure of rotation of the mid-gut loop, which normally takes place at the beginning of the tenth week of foetal life during the process of reduction of the "physiological umbilical hernia"; the colon and caecum, with the attached post-arterial mesentery, being allowed to enter the abdominal cavity first, instead of the normal mid-gut and pre-arterial mesentery—probably as a result of a lax umbilical ring. As a result of this mechanism, the later return of the mid-gut loop tends to displace the vitelline artery and hind-gut, with its post-arterial mesentery, to the left and dorsally, thus accounting for the left-sided position of the large bowel. Some attempt at normal fixation of the mesenteries had taken place, as is shown by the hepatic flexure occupying its normal position, in contradistinction to the more usual U-shaped transverse colon of non-rotation of the mid-gut loop, and this partial fixation probably prevented the marked tendency to volvulus around the superior mesenteric pedicle in early infancy, of which Dott describes two cases (*Brit. J. Surg.*, 1923, **11**, 251).

An unusual feature of the clinical findings was the presence of signs and symptoms in the right iliac fossa, at a point remote from the actual position of the appendix; but its deep pelvic situation might have accounted for this.

I am indebted to Dr. Ponder, county medical officer for Kent, and Mr. J. W. D. Buttery, medical superintendent of the Royal Victoria Hospital, Folkestone, for permission to publish this case.

A. Louis (*Thèse Paris*, 1945, No. 98), who records an illustrative case in a girl aged 19 months, came to the conclusion that the best treatment of Still's disease at the present time consists in intramuscular injection of gold salts.

Medical Memoranda

Four Cases of Hemicolectomy

Below are presented accounts of four cases of hemicolectomy performed for different and rare conditions.

Case Reports

Case 1.—Man aged 56. On admission the patient gave a history of increasing constipation for the past six months, together with colicky abdominal pain about seven hours after meals, loss of weight (one stone), and recent onset of vomiting after meals. On examination a palpable mass was felt occupying the right iliac fossa and right hypochondrium, which was not tender, but which was fixed to the posterior abdomen. *Operation.*—Heavy spinal anaesthesia. A plasma drip was started and a transverse muscle-cutting incision made. On exploring the abdomen an ileo-colic intussusception was found, extending as far as the middle of the transverse colon. It was possible to reduce the intussusception only up to the hepatic flexure, so it was decided to undertake a hemicolectomy, removing the terminal ileum, caecum, ascending colon, and hepatic flexure, and performing an ileotransversostomy. The patient made an uninterrupted recovery. The cause of the intussusception was a lymphosarcoma of the terminal ileum.

Case 2.—A woman aged 70. This patient was admitted as an emergency case (? acute appendicitis). She had complained of colicky abdominal pain in the umbilical region for the past eight hours and also of pain in the right iliac fossa. A history of a similar attack two months before was given. The temperature was 99° and the pulse 74. On examination a mass about the size of a hen's egg was palpable through the abdominal wall. *Operation.*—Heavy spinal anaesthesia. A plasma drip was started and a transverse muscle-splitting incision made. On exploring the abdomen an appendix 4 in. long, thickened and hard, was found. This thickening and hardness extended to about a third of the caecum. A diagnosis of carcinoma of the appendix was made, and a hemicolectomy was performed. The terminal ileum, caecum, ascending colon, and hepatic flexure were removed and an ileotransversostomy was done. The patient made an uninterrupted recovery except for an intramural abscess which developed at the outer part of the incision. On microscopical section an adenocarcinoma involving the appendix and extending into the caecum was found.

Case 3.—This patient, a woman aged 60, was admitted as an emergency case with a two-days history of central abdominal pain, colicky in type, and vomiting which began about two hours after onset of pain. This vomiting was not marked until just before admission to hospital. The bowels had moved on the day of the onset of abdominal pain, but had only a slight motion the next day; thereafter neither faeces nor flatus was passed. On examination the lower abdomen was distended, chiefly in the right iliac fossa: there was also tenderness over the lower abdomen. On auscultation peristalsis was increased; the general condition was good. *Operation.*—Heavy spinal anaesthesia. Plasma drip started. A right paramedian subumbilical incision was made, the caecum immediately presenting itself, greatly distended, black, and friable. The lower half of the ascending colon was also involved; the caecum and ascending colon had twisted anti-clockwise on the mesentery. The volvulus was apparently caused by a very long mesentery to the right colon. As the general condition was good, it was decided to carry out a hemicolectomy; the ileum, caecum, ascending colon, and hepatic flexure were removed and an ileotransversostomy was performed. The patient made an uninterrupted recovery.

Case 4.—A man aged 62. This patient was admitted as an emergency case with a two-days history of lower abdominal pain, colicky in nature, and vomiting soon after. On the day of admission vomiting (dark brown in type) had been continuous. He had been costive since the onset of abdominal pain and had passed neither flatus nor faeces on the day of admission. On examination the lower abdomen was distended (most markedly in the right iliac area) and was tympanic on percussion; there was also lower abdominal tenderness. On auscultation peristalsis was increased. Blood pressure was 110/82. *Operation.*—Cyclopropane anaesthesia. A plasma drip was started immediately. A right paramedian incision was made; there was volvulus of the caecum and the proximal half of the ascending colon, non-viable, friable, and blue-black in colour. A hemicolectomy was performed, removing the terminal ileum, caecum, ascending colon, and hepatic flexure, and ileotransversostomy was carried out. The patient developed pneumonia and died three days after operation.

Hugh MacCarthy, F.R.C.S.I.&Ed., M.R.C.P.I.

Allergy to Egg-prepared Vaccines

A case is here reported of an alarming reaction to the egg allergen in typhus vaccine. One previous case has been found in the literature, and more examples of similar reactions to preparations from egg media may be expected. Oral desensitization for six months enabled this patient to take 60,000 times the dose of allergen originally causing symptoms and to eat eggs with impunity. But skin tests were unchanged, and it would have been dangerous to attempt further inoculations. A simple precaution before giving injections of such vaccines would be to ask the question, "Do you eat eggs?"

Case Record

In Nov., 1943, an airman was admitted to No. 1 N.Z. General Hospital, Middle East Forces, in a state of severe collapse, having vomited blood and become acutely breathless and then comatose. He had an urticarial eruption and his respiration was asthmatic. By next morning he had completely recovered. He had been allergic to eggs all his life—35 years—and was usually able to avoid egg foods by their taste. But if he happened to swallow the food he would vomit, or, if there was no vomiting, he would get oedema of the lips, tongue, and larynx, asthma, urticaria, and general shock. He had never before vomited blood or passed into coma, and as he was at a meal when the symptoms came on he concluded that the rissoles contained egg. Further inquiry, however, showed that he had had his first antityphus inoculation 15 minutes before this meal. It was then clear that his reaction was due to the introduction of a large amount of egg protein parenterally. An extract of egg was made, and strongly positive scratch tests were obtained both in the patient and in a subject passively sensitized by his serum.

Oral desensitization was then started, daily doses being given of a quarter of a teaspoonful of a 1: 2,500 dilution of egg in water. At first this caused a mild reaction in the form of nausea and tingling of the lips, which lasted about half an hour. This reaction passed off in a few days, and the dose was increased by 50%. With a steady increase in this manner he continued the treatment until in July, 1944, he reached the dose of one raw egg daily, which has been continued since. On two occasions the sensitivity has shown signs of returning—once with a nasal cold and once when he stopped treatment for a few days.

In Sept., 1944, further scratch tests were made with egg extract and with undiluted typhus vaccine. Both gave strong reactions (3 plus), of no less intensity than before desensitization.

Discussion

The preparation of vaccines from viruses and rickettsiae on egg media is a recent method of which more and more examples will be seen in the future. And since a small section of the population are highly allergic to egg protein, this will lead to some severe or even fatal reactions.

For the following list of vaccines prepared on egg media and manufactured on a commercial scale I am indebted to Major E. C. Van Rooyen, R.A.M.C.

Typhus	Prepared from yolk sac
Yellow fever	" " egg embryo
Influenza	" " " "
Smallpox egg-lymph	" " allantois

An alarming reaction from the egg allergen in yellow-fever vaccine has already been reported by Swartz (1943), his patient developing asthma, gastro-intestinal allergy, and angioneurotic oedema a few minutes after the injection. My own patient gave a history of receiving yellow-fever inoculations without any ill effects, and apparently his sensitivity was to a yolk allergen not present in egg embryo.

The response to desensitization is in keeping with atopic sensitivities in general. At the outset the airman was sensitive to even the minute quantities of egg protein which could get into his circulation without being digested. Prolonged desensitization enabled him to take these minute amounts with impunity, but not the relatively large doses introduced by injection or scratch test.

I wish to thank Brig. H. S. Kenrick, C.B.E., F.D., N.Z.M.C., Director of Medical Services, N.Z.F.F., for permission to publish this report.

R. G. Park, M.D., M.R.C.P.,
Lieut.Col., N.Z. Medical Corps.

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Swartz, H. (1943). *J. Lab. clin. Med.*, **28**, 1663 (quoted in editorial, *J. Allergy*, 1944, **15**, 241).

The 25th report of the National Council for the Unmarried Mother and her Child (117, Piccadilly, W.1) has a foreword by the president, Lord Gorell, and is signed by the chairman, Mrs. H. A. L. Fisher, to whose devoted labours he pays tribute. The report covers a period of fifteen months and is a record of strenuous, unremitting and valuable work. Before long the Council hopes to become incorporated and enter upon a new stage of its existence. Meanwhile it has become affiliated to the National Council of Social Service while renewing affiliation to the National Council of Women and remaining a constituent body of the National Council for Maternity and Child Welfare. The Case Committee has dealt with an unprecedented number of cases, and the Ministry of Health's scheme for the care of women discharged from the Services on account of pregnancy has involved the Council in a very great deal of work. While the Council is not itself responsible for any home, nearly all the homes and hostels of the voluntary and statutory organizations are affiliated to it.

Reviews

WAR AND SOCIAL PSYCHIATRY

The Shaping of Psychiatry by War. By John Rawlings Rees, M.D. (Pp. 158. 10s. 6d.) London: Chapman and Hall. 1945.

Brigadier Rees, as consulting psychiatrist to the British Army, has had a unique opportunity of investigating the psychiatry of the war, which he has summarized in these Salmon lectures given in America. While he has for the most part described the work of others, he has himself been the inspiration of that work, and as such has, with the whole body of psychiatrists, Service and lay, changed the "shape" of psychiatry. The main problem of modern psychiatry is concerned not with the psychoses but with the numerous personality problems which, in certain adverse situations of work and of social environment, lead to the psychoneuroses and behaviour disorders. Methods of analytic treatment are necessarily prolonged and can, therefore, deal with only a small proportion of those who need such treatment. An effort must therefore be made to prevent even those who are predisposed from breaking down. This is the aim of social psychiatry, and the principles and means of coping with this problem in the Army have here been described. It opens up vast possibilities for civilian life in the future.

The "priorities" in social psychiatry are: first, methods of selecting the right man for the right job; secondly, prophylaxis by better training and "man management"; thirdly, morale; and, finally, treatment. The first three are fully dealt with and their methods described.

Selection.—Some points make very interesting reading; for instance, when all candidates are examined by the psychiatrist they welcome it, whereas if some only are selected for examination this implies that they are peculiar, and they dislike it. Brigadier Rees considers that the chief credential of a good psychiatrist is the personality qualification. The importance of personality qualifications is indicated in the fact that a much shorter course is required to make a good psychiatrist provided he is of the right personality. This applies also to the selection of officers: "It was early realized that in selecting men for commissioned rank the personality factor was the major consideration, provided that the candidate had adequate intelligence" (p. 72). But is personality a "factor"? Is it not the sum total of factors, of which intelligence is one? One nevertheless has an uncomfortable feeling that in assessing personality we are assessing something the nature of which is not understood or defined. For selection, the tendency has been away from laboratory tests to tests calling forth the whole personality, such as putting the officer into a difficult test situation with a number of his fellows without any instructions.

Prophylaxis.—While the author rightly stresses that those with analytic experience are the best capable of designing methods and carrying out these procedures, it is not perhaps sufficiently stressed that only by the radical investigation and treatment of the individual can the predisposing causes be rightly assessed and the prophylaxis become really effective. Without this, social psychiatry will become a superficial study and make blunders. The medical officer, says the author, has to think in terms of groups rather than of individual patients. This is true for prophylaxis, but it is not exclusively true of treatment; and it is to be questioned why the individual casualty suffering from a war neurosis should not receive the same care, say, as an orthopaedic patient, who sometimes takes months to recover.

Morale.—To many this will be the most interesting part of the work: for instance, the observations on the danger of discipline without morale. "The three main factors which make for good morale in wartime are: adequate war aim and purpose, a sense of one's competence and value, and the feeling that one matters as an individual in a group of other similar people" (p. 84). Some of these investigations confirm earlier opinions, but others gave unexpected results, such as that women (A.T.S.) in mixed batteries complained more of fear of sterility than of sex (possibly because fear inhibits sex), and that sexual disorders arose out of loneliness rather than excess of sex feeling. A hint from child psychology was found to apply also to Army recruits (p. 79)—namely, that it is best to let a recruit use his weapon first and then learn to look after it, otherwise he loses the enthusiasm with which he started and becomes bored. Some of us wondered at the beginning of the war whether a war could be successfully fought without hate. An interesting observation regarding morale is, therefore, that the original attempt to inculcate hate of the enemy was ineffective and led to depression; also that too much realism at first encouraged anxiety. The recruit had to be inoculated into realism. The importance of morale in war has always been recognized, but never so much as in this war. On page 95 Brigadier Rees states: "Wars are won, not by killing one's opponents, but by undermining their morale." But some of us may still believe that killing them is the most effective way of undermining their morale.

In the chapter "The Way Ahead" Brigadier Rees points out the application of the findings in war psychiatry to social psychiatry in civil life. These are but some samples of the large number of interesting subjects dealt with. Altogether it is a book that everyone interested in psychiatry, and in social and industrial medicine, should read. It gives a new orientation to the practice of psychiatry, and Brigadier Rees deserves the thanks of the profession for so lucid and interesting an introduction to the subject.

HISTORY OF ANAESTHESIA

The History of Surgical Anesthesia. By Thomas E. Keys. With an introductory essay by Chauncey D. Leake, and a concluding chapter by Noel A. Gillespie. (Pp. 191; illustrated. $6.00.) New York: Schuman's.

The serious study of the origins and development of a specialty augurs well for that specialty. Sturdy and well-cared-for roots can but ensure a healthy and productive tree. So far as anaesthesia is concerned an accurate and scholarly account of its history has been long overdue. The earlier appearance of such a history might have prevented both the duplication of invention and the undeserved praise for the supposed originality of the inventors.

Major Keys has obviously put enthusiasm and energy into his task and has managed to pack a remarkable amount of information into small compass. No anaesthetist will read this book without pride, nor surgeons without wonder that so much has been accomplished in the field of anaesthesia in so short a time. The emphasis on American achievement is a little heavy, and British anaesthetists may feel that the very noteworthy contribution of this country to the development of inhalation anaesthesia in the 19th century is treated rather cursorily. One of the many lessons to be learnt from reading this book is that progress in anaesthesia is not to be made by a new knob here or an altered tap there. Such stories as that of divinyl ether, told by Chauncey Leake in the introductory essay, are examples to inspire those who would make real contributions to the subject.

Major Keys has made his material not only readable but enjoyable both to the medical and to the interested lay reader. For the anaesthetist, however, the book cannot be regarded as the last word on the subject. There are only some 90 pages of text, the other half of the book consisting of a chronology, lists of references, and an index. Included, also, is a short and excellent essay by Dr. Gillespie on the future of anaesthesia. Inevitably, therefore, much has had to be omitted. Thus no reference is made to Cattlin, whose revolutionary introduction, in 1868, of a reservoir bag, now frequently misnamed a rebreathing bag, made it possible to dispense with the cumbersome gasometer. Clover, an illustrious pioneer in this country, receives but five lines in the text, in none of which are even mentioned his more important contributions, such as the, to us, familiar ether inhaler and the very ingenious and accurate apparatus for the production and administration of known percentages of chloroform. They receive a bare mention in the chronology. Some of the sources might not satisfy the academic, who would dispute the superiority of an encyclopaedia over an author's own works as to what the author did or did not say.

Most of the illustrations are portraits, and but few are instructive or help to clarify the text. They provide, however, a fine picture gallery of Americans, past and present, whose names are respected in anaesthesia. Queen Victoria finds herself in strange company. Her patronage of and submission to anaesthesia *à la reine* seem little qualification for inclusion of her portrait here.

However, these are but small blemishes in an excellent little book. One hopes that it will be widely read and become a pioneer, to be followed by more exhaustive works on this subject, which will provide not only interest for the clinician but also a detailed source of reference for the research worker in anaesthetics.

COSMETICS

Modern Cosmeticology. By Ralph G. Harry, F.R.I.C. Second edition. (Pp. 432; illustrated. 35s.) London: Leonard Hill Ltd. 1944.

This book had a very good reception when first published in 1939. There are considerable alterations in the new edition. The book has grown very greatly, having expanded from fewer than 300 to over 400 pages, and is now embellished with numerous figures, including 8 coloured plates. It may be added that, whereas it was originally published in New York, it has crossed the ocean, notwithstanding the difficulties of war, and is now published in London. Although it has greatly increased in size the paper used is much thinner, and it has diminished in bulk and is very convenient to handle.

The new edition is fortified by a foreword from Dr. P. B. Mumford, who gives it his blessing. The scientific approach to the whole subject, which we noted with satisfaction in the first edition, is still well maintained—perhaps this is in large measure due to the fact that Mr. Harry is an original investigator of some experience. He himself has worked particularly on the conditions necessary for the preservation of oils. These compounds are of much importance in the manufacture of many forms of cosmetics, and they are very liable to become rancid owing to the development of a certain degree of oxidation in them, and rancidity spoils any cosmetic preparation. This tendency can be controlled to a very large extent by the help which certain anti-oxidants give to the keeping qualities of various oils. His experiments show that gum guaiacum is a very good anti-oxidant which has the advantage that, unlike several other compounds that have been used for the purpose, it appears to be quite innocuous.

This volume includes a consideration not only of creams and powders but also of the cosmetic problems presented by the hair, the teeth, the nails, and, in fact, by all the cutaneous appendages. Naturally it overlaps the domain of the skin physician, but the author is extremely careful not to trespass too far into pathology and therapeutics, and there is no doubt that the dermatologist can profit a great deal from study of this book; in fact, even more from the present edition than from the original one. On the whole the illustrations are apposite and useful, but it is doubtful whether the coloured photomicrographs of the human skin and scalp are valuable enough to justify the additional cost they must involve. They throw very little light upon the problems with which cosmetics are concerned. This, however, is a very minor blemish, if indeed a blemish at all, and we have no hesitation in recommending *Modern Cosmeticology* to all concerned with the enhancement of human beauty.

Notes on Books

Dr. ARLETTE BARBEQUOT-BUTAVAND has produced a book—*Cahiers de Dessins d'Anatomie*—for the use of the hospital attendants and nursing staff of the Medical School at Lyons. It is issued by J. B. Baillière et Fils, of Paris, in two parts, each containing 57 plates and comprising 203 separate figures. These consist of a series of anatomical drawings in simple outline, with brief legends and names of the principal parts, supplemented by occasional comments. The drawings are arranged in copybook form, the plates being on one side of the opened book—the left—whereas the opposite page on the right is left blank, to be filled in by the pupil with notes or copies of the printed drawings, which it is suggested may be coloured so as to distinguish bones, arteries, veins, nerves, and muscles from one another. The principal object which the author has had in mind is, he states, twofold: since anatomy is easily understood and impressed on the memory by drawings, to provide something concrete, which will enable each pupil to develop his own powers of observation and dexterity in drawing; and at the same time to cultivate his visual memory. He also recommends that pupils should, when possible, supplement the drawings on the printed page by original drawings from Nature, and thus increase the value of their course of study and of the books they read and benefit them in the exercise of their profession. In these days, when hospital attendants, nurses, and doctors of different nationalities frequently become associated in their work, the publication of these two "Cahiers" should be no bar to their use by English-speaking readers, but, on the contrary, a distinct advantage, since it would tend to familiarize them with the names of the various parts and organs of the body in the French language.

The importance of the care and housing of the aged is being increasingly realized. A pamphlet entitled *Bucks Old People's Welfare* tells the story of the formation of a county committee for that purpose at Aylesbury on Feb. 3, 1945. Sir Leonard West, chairman of the Buckinghamshire County Council, presided, and every branch of social endeavour was represented. It was pointed out by Mrs. Keeling that it was the transfer of responsibility for supplementary pensions in December, 1940, to the Assistance Board that had brought to light the fact that many old people were living alone under the most unfavourable conditions. The aim of this committee was to see that such were not only fed, clothed, and sheltered "in a negative kind of peace" but enabled to spend what was left of their lives in "positive happiness." In pursuit of this laudable, if difficult, objective, representatives were appointed to look into the situation and to report later with suggestions to an adjourned conference. The body of this booklet discusses, in an interesting way, both short-term and long-term policy for remedying a gap in our social services still inadequately filled, though some real success has been achieved already. It is evidently written by an enthusiast for the subject, with definite and clear-cut ideas. Copies may be had from the printers, Hunt, Barnard and Co., Aylesbury, price 1s. 2d. post free.

The welcome we gave to the first edition of Dr. JULIUS BAUER'S *Constitution and Disease* can be given with equal cordiality to the second (William Heinemann; 21s.). That this has been called for within eighteen months of the publication of the original edition proves its usefulness. For too long the genetic factor in disease received scanty and intermittent attention, and although this is being corrected it has not been easy to obtain the evidence in a compact form such as is now possible from these pages. In this new edition the text has been amplified, the bibliography has been added to considerably, and it is now, as it should be, provided with an adequate index.

We have noticed in these columns several books on the population problem. Mr. MARK ABRAMS'S little book, *The Population of Great Britain: Current Trends and Future Problems* (George Allen and Unwin; 3s. 6d.) is among the best; it is very clearly written and objective. It can be read through in an hour and provides any intelligent person with an adequate basis of knowledge. We may add that, unlike so many wartime books, it is pleasant to look at and read.

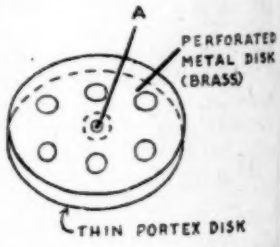
Preparations and Appliances

VALVE DISK FOR CIRCLE ABSORBERS

Dr. J. CLUTTON-BROCK (Lincoln) sends the following description of a new valve disk for circle absorbers:

This device consists of a disk of thin flexible portex joined concentrically to a thin perforated disk of metal.

I have found these disks very satisfactory in my absorber as they only weigh 13 gr. as opposed to 34 gr. for a standard metal disk of the same size. There is no tendency to blow back at a pressure of 200 mm. Hg. Although they are, perhaps, a little heavier than a similar bakelite disk, there is no question of warping, and I have found most bakelite disks definitely not very flat. The two disks are joined together at the point A by a small aluminium rivet. The thickness of the metal disk is 0.005 in., and the portex 0.007 in. The thin portex disk lies on the knife edges and makes a perfect airtight seal.



SULPHATHIAZOLE SUSPENSION

Messrs. Menley and James, Ltd., now offer for sale "mickraform" sulphathiazole suspension. It is a sterile suspension containing 20% sulphathiazole in very fine crystalline form, far finer than ordinary crystals. Since sulphathiazole has a low solubility, these smaller crystals give a much better chance of the sulphathiazole getting into solution. The suspension can be applied much more effectively than powder to deep wounds. It has a *p*H between 5.5 and 6.5, and is said to be stable.

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DOSAGE AND EFFECTS OF CHOLINE CHLORIDE

In a recent letter to this *Journal* J. A. Barclay and co-workers[1] have suggested that the dosage of methionine and choline should be much higher than the amounts used in the therapeutic trials which have been reported in the *Journal*[2] and elsewhere. They calculate that the curative dose in man would be 20 grammes of choline a day for two or three weeks, or 20 to 60 grammes of methionine a day for a period as yet undetermined. For the moment such quantities of methionine can be dismissed as unobtainable for general therapeutic use. Choline is a simpler and cheaper compound, and as it is likely to be the subject of further therapeutic trials in diseases of the liver and kidneys and in protein malnutrition, the following observations on dosage and toxic effects may be of value to intending prescribers.

Twenty years ago physiologists and physicians were interested in choline chiefly because it was the parent substance of acetyl choline. It has, in fact, much the same action on the autonomic nervous system as acetyl choline, acetyl-β-methyl choline, and carbamyl choline, though it is far less potent. Sollman[3] states that cats show no ill effect after the slow intravenous injection of 15 mg. per kilogramme of body weight; 35 mg. per kg. are fatal. As the choline is rapidly destroyed, 0.8 to 0.9 mg. per kg. a minute may be injected "practically indefinitely." This corresponds to a dosage of approximately 3 grammes an hour in man. Slow intravenous injections have been recommended for the treatment of paralytic ileus, and this probably represented the only therapeutic indication for choline until the last two or three years. Both the *British Pharmaceutical Codex* (1934) and the *Extra Pharmacopoeia* (Martindale, 1941) give the dose for this purpose as 10 grains (0.6 g.) intravenously, though the latter subsequently recommends "10 g. in 180 ml. of normal saline," which is presumably a misprint.

During the past decade a considerable literature has accumulated on the nutritional significance of choline. It is now regarded as an important constituent of the vitamin B complex which is concerned in the transport of fat in the body and is essential for the health of the liver and the kidneys. As a consequence choline chloride has been used in the treatment of acute and chronic disease of the liver in man. On theoretical grounds more might be expected of choline in chronic enlargement of the liver and the fatty type of cirrhosis than in acute hepatitis or in the shrunken liver of atrophic cirrhosis. Therapeutic trials of choline in cirrhosis so far reported have been carried out without controls, and a decisive answer will not be obtained until a large number of cases is collected and alternate patients are treated with and without the drug. Reports on the treatment of isolated cases of acute hepatitis or acute necrosis are likewise suspect. It is difficult to follow Barclay's argument that results become more convincing when they are buttressed by metabolic data; changes in metabolism are just as much subject to the statistical law of variation, and demand just as careful controls, as clinical improvement or deterioration. Our purpose, however, is not to assess the clinical value of choline but to discuss the dosage by mouth and the possibility of toxic effects from long-continued administration.

The daily requirement of choline chloride has been estimated approximately in the growing rat. Griffith[4] puts it at 4 to 6 mg., and Engel[5] at 10 mg. for a 40-gramme rat. This works out at 250 mg. per kilogramme of body weight. This figure probably represents the order of dosage required in man, for, although the growing rat has a high rate of metabolism and therefore uses a lot of choline compared with an adult man, this is balanced by the fact that the dosage of vitamins in disease has to be much higher than the maintenance dose. In the dog, Fouts[6] has used 100 mg. per kg. of body weight to counteract the effects of a low protein diet, but Kaplan and Chaikoff[7] found a higher dose necessary to exert a curative action on the fatty liver of experimental animals. They had to give 400 mg. of choline chloride per kg. for more than three weeks to reduce the fat content of the liver of the depancreatized dog to normal levels. Dosage in man has hitherto been a good deal lower. Broun and Muether[8] treated four patients with cirrhosis with choline chloride in a dosage of 1 g. daily for periods up to two years. Russakoff and Blumberg[9] in ten cases of cirrhosis gave up to 6 g. of choline chloride a day in divided dosage. One of their patients, who was given 0.5 g. of choline chloride on an empty stomach, complained of nausea, which was associated with a slight drop of blood pressure and slowing of the heart; otherwise there were no ill effects. Their highest single dose appears to have been 1.5 g. Richardson[10] gave 1.5 g. of choline chloride a day for eight days to sixteen patients with infective hepatitis without appreciable effect.

Only one author has described ill effects from continued administration of choline chloride, and his observations have not been confirmed in man. Davis[11] has reported that the red cell count in dogs falls when they are given choline chloride by mouth for fifteen days or longer. He observed a fall when the choline was given in a single dose of 8 mg. per kg. a day, but the effect was greater when 10 mg. per kg. of choline chloride was given thrice daily.[12] The anaemia was attributed to dilatation of the blood vessels by the choline and increased supply of oxygen to the bone-marrow. Davis suggested the possibility that dogs prepared in this way might be used for the biological assay of liver extracts for the treatment of pernicious anaemia.

1 *British Medical Journal*, 1945, **2**, 298.
2 Ibid., 1945, **1**, 415.
3 *Manual of Pharmacology*, 6th ed., Philadelphia, 1942.
4 *J. Nutrit.*, 1941, **22**, 239.
5 Ibid., 1942, **24**, 174.
6 Ibid., 1943, **25**, 217.
7 *J. biol. Chem.*, 1937, **120**, 647.
8 *J. Amer. med. Ass.*, 1942, **118**, 1403.
9 *Ann. intern. Med.*, 1944, **21**, 848.
10 *British Medical Journal*, 1945, **2**, 156.
11 *Amer. J. Physiol.*, 1944, **142**, 65.
12 Ibid., 1944, **142**, 402.

Davis[13] has also reported that choline chloride in a daily dose of 100 mg. by stomach tube is effective in partially reducing cobalt polycythaemia in rabbits. These experiments have not been supported by observations on man. Cartwright and Wintrobe[14] found that choline chloride had no effect on the blood count in man when given in doses of 10 mg. per kg. of body weight orally three times daily, and choline chloride has been tried without success in a smaller dosage in polycythaemia in man.[15 16] Finally, there is the paradox that Moosnick, Schleicher, and Peterson[17] report the cure of a refractory case of pernicious anaemia by means of intravenous injections of choline chloride, 1 g. daily. They suggest that fatty infiltration of the liver prevented successful elaboration of the liver extract and that the infiltration was removed by the choline.

The conclusion from the literature is that the effective dose of choline chloride for the treatment of disease of the liver or kidneys, and for disturbances of nutrition or metabolism, is likely to be at least 100 mg. per kg. of body weight, or 6 g. a day in an adult man, and it might be three or four times as high. In other words, the curative dose of choline chloride must approach close to the toxic dose. The danger is a sudden flooding of the circulation with choline and consequent depression of the heart and blood pressure. This has happened with as little as 0.5 g. taken on the fasting stomach in man. This danger and other disadvantages may be circumvented by intravenous drip therapy, as Barclay suggests, but whatever expedient is used treatment with choline will need careful supervision if it is to be both effective and safe. The risk of depression of the bone-marrow can probably be discounted, but it would be well to keep a watchful eye on the blood count until more is known about the reaction of the human marrow to high dosage. Furthermore, we cannot regard the therapeutic failure of choline in human polycythaemia as completely demonstrated until maximum tolerated doses have been tried.

LUNG DISEASE IN COAL-MINERS

To do justice to the fascinating material in the third report recently issued by the Medical Research Council's Committee on Industrial Pulmonary Disease[18] would tax the ingenuity of the most experienced abstracter. In a small volume of 94 pages is accumulated what must surely be a unique series of experimental attacks on the fundamental problems of coal-miner's disease, carried out quietly and with restraint at a period when the world's greatest war was being waged. It will be recalled that the committee's scheme of inquiry included a medical survey and related pathological studies of chronic pulmonary disease in South Wales in terms of the environmental background. Previous reports have dealt with these facets, ranging over physical, chemical, and petrological no less than medical peculiarities. The third report is a complementary one, and describes the experimental problems which have been encountered. It must be a source of satisfaction to the committee that a convincing answer to many queries has been given by their colleagues in the laboratory.

Before attempting to give some idea of what awaits the reader it will be useful to remind him of the trend of previous investigations sponsored by the committee. A careful survey established beyond doubt the responsibility of air-borne dust as a factor of first importance in the production of coal-miner's disease. Chemical and petrological investigations of the nature of such dust, and of the coal seams and adjacent rock strata from which the dust is derived, brought out the complexities of the disease-producing agent, and suggested that variations in the incidence of pneumoconiosis might depend on differences in the dusts. It can now be stated that the composition of mineral residue obtained from the lungs varies with the occupation of the miners, according to differences in the dust-producing strata in which the men work. Although anthracite colliers show no significant increase in dust or total silica or quartz with increasing degrees of fibrosis of their lungs, the group as a whole has an increased quartz residue when the picture of silicotic nodulation is impressed on the pulmonary tissue. Prof. E. J. King and his co-workers consider that quartz, rather than mica or kaolin, constitutes the chief hazard, though its activity may be modified by the other dust components. Some idea of the relative importance of the various dusts as agents of disease may be obtained by introducing them into the lungs of experimental animals—a method developed by the late Prof. E. H. Kettle. Belt and King find that the purest coal dust, whether anthracite or steam coal or bituminous, has a low pathogenicity. Animals so treated show little fibrosis in their lungs even after the lapse of long periods of time. As the content of siliceous material in the coal dust increases so do its pathogenic properties. Mixing quartz dust with shale dust, which is lowly pathogenic, substantially reduces the harmful nature of the quartz. Mixtures of quartz dust and coal give a confluent fibrosis more closely allied to that seen in coal-workers than the lesion resulting from pure quartz dust. It is apparent that many factors are concerned in the production of the South Wales pulmonary disease; among them are the quantity of siliceous matter in the inhaled dust and the presence of mineral matter which modifies the deleterious action of silica. The problem is complicated by the observation that some siliceous dusts are harmful and others relatively harmless; so far there is no clear explanation for these differences. In accounting for the injurious effect of silica the possibility of a toxic action on tissue cells when it is in solution has to be considered. The difficulties encountered in establishing this hypothesis are set out in the admirable report of Prof. King, who has earned the gratitude of at least one reader for the lucidity he has brought to a forbidding chemical labyrinth. In general it seems to be true that the more soluble a siliceous dust the greater its toxicity; but there are many exceptions to this generalization, and further investigation is required for a satisfactory answer.

What, then, is the present position of the coal-miner's problem? The third report of the Medical Research Council's committee suggests that quartz is probably the

[13] *J. Pharmacol.*, 1941, **73**, 162.
[14] *J. Amer. med. Ass.*, 1945, **127**, 911.
[15] Carpenter, G., *Amer. J. med. Sci.*, 1940, **200**, 462.
[16] Meyer, O. O., and Thewlis, E. W., *J. Lab. clin. Med.*, 1941, **26**, 1137.
[17] *J. clin. Invest.*, 1945, **24**, 278.
[18] *Chronic Pulmonary Disease in South Wales Coalminers.* III. Experimental Studies. Med. Res. Cncl. Spec. Rep. Ser. No. 250. H.M. Stationery Office. (5s.)

most noxious factor, but that its action is modified by admixture with other substances. The South Wales dust is composed of small amounts of quartz mixed with large amounts of coal and other minerals, either of which may contribute its part or even exert an antidotal effect on the action of the quartz. This sort of explanation might account for the decrease in incidence of pneumoconiosis among colliers in South Wales with the rank of the coal mined, from high in anthracite to low in bituminous coal. In other words, there must be considered a number of possibilities, such as a generally higher dust concentration in anthracite mines, differences of interaction of quartz with different types of coal, or differences of modification of quartz effect because of varying mineral composition of the shales and other strata associated with the coal. It seems likely at the moment that all these factors are involved in causing the differences in the incidence of pneumoconiosis—a truly formidable prospect for the investigator. If the M.R.C. reports are an indication of the energy and inspiration which will be directed in the future towards a most difficult problem, there need be no room for pessimism over its solution.

THE EFFECTS OF LIGHTNING

Since Seneca, doctors and philosophers have for centuries been interested in the diverse and often bizarre sequelae of lightning-stroke, and the manner of death. Pliny's opinion that a person who has heard the clap of thunder and seen the lightning flash can consider himself safe from that particular hazard has a curious topical ring in view of the beliefs as to survival during aerial bombing and falling V1 and V2 projectiles. Among the seventeenth- and eighteenth-century writers on fulguration we can with benefit re-read J. A. Dietericus,[1] J. A. Münnich,[2] F. J. Baier,[3] C. F. Hoffmann,[4] and J. G. Biedermann.[5] In the nineteenth century more serious attempts were made to study the physiology and pathology of lightning-stroke, and the monographs by Bonnet[6] and by F. Sestier[7] are classics. L. Weber's report on the Schleswig-Holstein disaster of 1878, in which 92 people were struck and 10 killed, may be taken in conjunction with F. Panse's account[8] of the Königstein incident, where, out of a party of 29, 3 were killed and 26 temporarily paralysed. Charcot was particularly interested in the neurological effects of lightning—a phenomenon which he termed "keraunoparalysis." In more recent years the subject has been written up by H. A. Spencer[9] and by M. Critchley.[10 11]

The Goulstonian Lectures of Dr. A. J. Jex-Blake on "Death from Electric Currents and by Lightning"[12] are well remembered. This same author has lately contributed a paper to the *East African Medical Journal*[13] dealing with modern ideas on the physics of lightning. We learn that the electrical potential between the two ends of a flash is around a thousand million volts. The current is direct, amounting to 20,000 amperes at least, and the quantity of electricity conveyed averages 20 coulombs. Most of the energy is converted into heat, but there also appear Hertzian waves (or "atmospherics") with a frequency of 20,000 or so. According to Simpson's "breaking-drop" theory[14] it is considered that electricity separates whenever a raindrop breaks up into a number of smaller particles. The water becomes positively charged, the air negatively. The upward movement of warmed air brings about an electrical separation. A single flash occupies a thousandth of a second, and photographs demonstrate that it follows a meandering course with lateral branches, and has not the conventional zigzag shape depicted by artists. When lightning strikes sandy soil it may produce by fusion an irregular fulgurite or lightning-stone, reminiscent of the vitreous changes brought about in Hiroshima by the detonation of the atomic bomb.

The same issue of the *East African Medical Journal*[15] contains an editorial on "What to do in a Thunderstorm." One should remain indoors, with doors and windows shut, and away from the fireplace. Telephones may be used with impunity, but the neighbourhood of the main electrical switch and meter should be avoided. The lead-in wire from the aerial to the wireless set should be fitted with a switch to permit earthing. Out of doors one should shun crowds, flocks of cattle, isolated trees, hedges, walls, and river banks. It is better for one's clothes to be soaking wet than dry. To hold up an open umbrella is unwise. The treatment for apparent death after lightning-stroke is prompt artificial respiration, continued if necessary for hours or until the body cools or rigor mortis ensues.

It is common knowledge that Great Britain is relatively immune from severe thunderstorms as compared with Kenya and South Africa. Nevertheless during the 29 years 1852–80 there were 546 fatal cases of lightning-stroke in England and Wales, and in the decade 1901–10 there were 124 deaths. A. G. S. Mahomed[16] considered from an analysis of 237 fatalities that lightning storms in England and Wales are commonest on the plains and oolitic uplands, but the usual belief that lightning is more frequent along the course of rivers was not supported.

NUTRITIONAL SURVEYS IN ITALY

An U.N.R.R.A. medical programme in Italy was described at a recent Press conference in London by Dr. J. Metcoff, one of two young Harvard doctors, the other being Dr. A. McQueeney, who have been carrying out nutritional surveys in that country. Dr. Metcoff explained that the U.N.R.R.A. programme had three main objectives: (1) to determine the degree of malnutrition in Italy as evidenced by clinical examination; (2) to use the results for the purpose of providing foodstuffs to meet specific needs; and (3) to bring Italian organization to a stage at which it would be able to assume responsibility. During a period of six or seven months, beginning in January last, some 34 surveys had been carried out in areas of Rome and Milan, also south of Rome, and to the north from Pisa to Ravenna. Data were obtained on the heights and weights of selected poorer children who were likely to be undernourished. The statistics were thus heavily weighted in favour of reflecting the lower levels of malnutrition in Italy, not the average nutrition. The object was to gain information rapidly, and to utilize it rather than to obtain the exact statistics desirable in an ordinary research project.

Out of some 2,500 children, about 31% showed some form of classical nutritional deficiency, and of that deficient class roughly 90% had rickets. Only 17 cases of gross inanition or profound malnutrition of the starvation type were discovered, and these were all in infants in insti-

[1] *De fulmine et tonitue ac fulgure*, 1696.
[2] *Relatio physica medica*, 1732.
[3] *Oratio de fulminibus literatorum ordini fatalibus*, 1756.
[4] *De Morte in fulmine tactis*, 1766.
[5] *De causis subitae mortis fulmine tactorum*, 1768.
[6] *Des effects de la foudre sur l'homme*, 1859.
[7] *De la foudre, de ses effects, et de ses formes*, Paris, 2 vols., 1866.
[8] *Mschr. f. Psych. Neurol.*, 1925, **59**, 323.
[9] *Lightning, Lightning-stroke, and its Treatment*, London, 1913.
[10] *Lancet*, 1934, **1**, 68.
[11] *Bristol med.-chir. J.*, 1932, **49**, 285.
[12] *British Medical Journal*, 1913, **1**, 425, 492, 548, 601.
[13] *E. Afr. med. J.*, 1945, **22**, 170.
[14] *Proc. roy. Soc. Lond.*, 1937, **A161**, 309.
[15] *E. Afr. med. J.*, 1945, **22**, 165.
[16] *Proc. roy. Soc. Med.* (Sect. Baln.), 1916–17, **10**, 45.

tutions. Of the mothers examined 3.5% had classical nutritional deficiencies. Attention had been mainly directed to expectant and nursing mothers, the groups most likely to show the first evidences of malnutrition. A number of the persons examined were in refugee camps. The deficiencies most frequently suggested were in riboflavin and vitamin A.

A technical committee on nutrition had been set up by the Italian Government. Its members included eminent medical specialists, and it had issued a pamphlet as a basis for examination of the population generally, but more specifically of mothers and children. This pamphlet had been sent to about 20,000 doctors in Italy, accompanied by a record card for setting out the findings of their own examinations. The information thus gathered from the whole country was sent to the central committee, and in essence it provided a system, which was still in its early stages, for the notification of malnutrition. Dr. Metcoff believed that Italy was one of the few countries, if not the only country, which had made malnutrition a notifiable disease. The pamphlet also gave a basic food schedule for infants—a standard method which went as far as it was possible at the moment to go in this direction. Mothers and children in need would thus be enabled to obtain supplementary foodstuffs from U.N.R.R.A., the amount and kind being determined on an economic and medical basis. The economic need must be considered independently of the medical need, because it was conceivable in such a country that a person might exhibit no signs of gross malnutrition and yet be in great need of food.

The Nutrition Committee of the Italian Government, said Dr. Metcoff, had also started a series of training courses for Italian doctors. The courses were to be carried out at five universities, and the programme in the University of Rome had already begun. Each course lasted for about two weeks and consisted of some 38 hours of didactic lectures and a similar amount of time in practical demonstrations. Doctors who had been out of contact with recent developments, especially on the nutritional side and in paediatrics and maternal welfare, would thus have an opportunity of being refreshed. Infant mortality in Italy had always been high. It was difficult to determine the actual mortality at the moment, but the general feeling was that it had not been greatly aggravated. Rickets had undergone a sudden increase during the war, but no exact comparison with pre-war figures was available. There was also an increase in tuberculosis. In view of the many other causes operating in wartime favouring tuberculosis, such as overcrowding and the distribution of infected people among the population, this must not be regarded as attributable to malnutrition. Children's clinics in Italy, while architecturally satisfactory, appeared to be under-used. Some of the larger clinics were found to be caring only perhaps for two dozen children, whereas similar clinics in other countries would be serving in the course of the year a couple of thousand. Steps were now being taken for the clinics to be more adequately used.

RELAXIN

In 1854 Duncan[1] published his observations on "The Behaviour of the Pelvic Articulations in the Mechanism of Parturition." Ever since it has been recognized that a relaxation of the pelvic ligaments occurs during pregnancy, but only in the last two decades has the mystery of this mechanism begun to clear. In the 'twenties Hisaw and his colleagues[2-5] demonstrated the nature of the relaxation as it occurs in guinea-pigs, and found in the serum of pregnant animals of many kinds a substance which they called "relaxin." They prepared a powerful extract of the hormone from the corpora lutea of sows,[6] and claimed that it was distinct from both oestrone and progesterone. Confirmatory evidence was published by Brouha,[7-9] Pommerenke,[10] and Abramson *et al.*,[11] but the discovery by de Fremery *et al.*,[12] Courrier,[13] Tapfer and Taslhofer,[14] and Haterius and Fugo[15] that relaxation can be brought about by oestrogens and progesterone naturally cast doubts upon the existence of relaxin as a separate hormone. That oestrogens are capable of producing relaxation is, indeed, a fact of veterinary importance, for the consequent alteration in the morphology of the hind-quarters of cows is a cause of the fractures which occur when stilboestrol is used with a view to increasing the production of milk.[16]

These doubts have stimulated Hisaw and his colleagues to further research. They have now shown[17] that a preparation of relaxin can be made which has no oestrogenic effect in a dose 120 times and no progestational effect in a dose 500 times that required to relax the pelvic ligaments of guinea-pigs. They showed also that relaxin not only fails to bring on the physiological effects of oestradiol and progesterone but differs from them chemically in being insoluble in fat solvents. The relaxing effect of relaxin is maximal 6 hours after injection, that of progesterone 72 to 96 hours later. The injection of progesterone into intact animals (but not into those which have been castrated and hysterectomized) is followed after the same interval by the appearance of relaxin in the blood. Progesterone, moreover, cannot bring about relaxation in castrated and hysterectomized animals. It seems probable, therefore, that the relaxation it causes in intact animals is due to the fact that it stimulates the formation of relaxin in the genital tract. Oestradiol is likewise capable of doing this in intact animals, and in castrates, but not in castrated hysterectomized females. In them, however, it potentiates the action of injected relaxin, and it has in all probability some independent relaxing activity. It is noteworthy that so far relaxin has been found only in conditions in which progesterone is normally present. One of the functions of progesterone may well be the formation of relaxin in the uterus. In unpregnant females only the concentration found in pseudo-pregnant animals can be experimentally achieved. This is one-fiftieth the concentration found in normal pregnancy, and it therefore seems likely that the placenta is the main site of formation of relaxin.

Although the changes induced by relaxin in animals are not identical with those found in women, they are similar enough to suggest that a parallel mechanism is at work. Moreover, relaxin has been found in the serum of pregnant women by Abramson and his colleagues.[11] The possible clinical significance of these findings is obvious, and further work on the human subject will be eagerly awaited.

The Minister of Health (Mr. Aneurin Bevan) is reported to have stated at a meeting of the Society of Physiotherapists on Oct. 20 that by the early months of 1946 he would be presenting a Bill in the House of Commons for a comprehensive health service.

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3 *Proc. Soc. exp. Biol.*, N.Y., 1926, **23**, 661.
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5 *Physiol. Zool.*, 1929, **2**, 59.
6 *J. Amer. chem. Soc.*, 1930, **52**, 3340.
7 *C. r. Soc. Biol.*, Paris, 1928, **99**, 1769.
8 Ibid., 1932, **109**, 548.
9 *Arch. int. Pharmacodyn.*, 1934, **48**, 147.
10 *Amer. J. Obstet. Gynec.*, 1934, **27**, 708.
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13 *Proc. Soc. internat. Congr. Sex Research, Edinb.*, 1931, 357.
14 *Arch. Gynäk.*, 1935, **159**, 313.
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16 *J. Endocrinol.*, 1944, **4**, 19.
17 Abramowitz, A. A., Money, W. L., Zarrow, M. X., Talmage, R. V. K., Kleinholz, L. H., and Hisaw, F. L., *Endocrinol.*, 1944, **34**, 103.

ANNUAL HARVEIAN COMMEMORATION

THE PRIME MINISTER WITH THE ROYAL COLLEGE OF PHYSICIANS

The Harveian Dinner of the Royal College of Physicians was held at the Dorchester Hotel on St. Luke's Day, when Lord Moran presided over a company numbering about two hundred. The principal guests were the Archbishop of Canterbury, the Lord Chancellor, the Prime Minister and several members of his Cabinet, the Prime Minister of Canada, Mr. Anthony Eden and other members of the late Government, the French, Soviet, and Chinese Ambassadors, the Lord Mayor of London, the President of the Royal College of Surgeons, and representatives of other medical bodies, including the President and the Chairman of Council of the British Medical Association. It was a notable occasion, and not least because of the blend of seriousness, wit, and brilliance as represented in the speeches of the Prime Minister, the Archbishop of Canterbury, and the President of the College.

The PRIME MINISTER, who said that though he spoke as a layman he could claim many doctors in his family tree, both as ancestors and as collaterals, proposed the health of the Royal College. Since the foundation of the College, over four hundred years ago, it had played a noteworthy part in contributing to the health and happiness of mankind, and it was well in these days of change, when so many monuments of the past were being swept away, to consider the continuity of effort directed to a single aim which the College represented.

Mr. Attlee went on to speak of two outstanding advances in medicine during the war, one of them, which would have been of special interest to Harvey himself, the development of the blood transfusion service, and the other the discovery of penicillin. But in mentioning these advances on the research side he wished also to pay tribute to the personnel of the medical profession, both in the fighting Forces and in civil practice. Here he digressed to speak of the services rendered by the President to the late Prime Minister:

> "We in the War Cabinet often had great anxiety owing to the vigorous travelling habits of our wartime Prime Minister, and it was always a comfort to know that on these expeditions he was under the care of Lord Moran."

After saying that he could give no details of the Government's proposals for a National Health Service, Mr. Attlee proceeded:

> "We seek a service which will be comprehensive in the double sense of being available to every member of the population and of covering every form of medical and allied activity. We intend to have a service in which no patient shall be without the treatment he needs through lack of money or through deficiency in or lack of organization of the necessary facilities. We need, too, a service in which professional men and women will be able to devote themselves to their great calling without financial anxiety and without in any way feeling cramped and over-controlled by regulations."

He spoke of the need for a great improvement in the hospital service, in the facilities for diagnosis and treatment outside hospitals, in the number and distribution of medical men, both consultants and general practitioners, and perhaps above all in the planning and organization of all the different branches into a single integrated service. "The task is not easy, but we are going to do it. Above all we realize—no one more keenly than my friend the Minister of Health, who is here this evening—that for this to be successful we must have the help and co-operation of the profession itself."

Doctors and Politicians

Lord MORAN began by giving a little ancient College history. In 1637, when the College prepared for the Government a report on the health of the people—a report which would do credit to any modern medical officer of health—it ended by proposing a Ministry of Health. The actual words were: "They suggest the provision of a commission or office of health, which has been found useful in Spain, Italy, and elsewhere." The Ministry was established nearly 300 years later. The College still made suggestions, and on the whole he thought the tempo had quickened a little! Truth compelled him to say that not all the College pronouncements were so prescient. In 1648 it pronounced public baths hurtful to the commonwealth and cited the experience of Athens and Rome to show that they caused physical effeminacy and debauchery of manners.

Politics and medicine, Lord Moran went on, had certain things in common. The Prime Minister of one of the Dominions once said to him that the great thing in politics was to avoid mistakes, and certainly in the practice of medicine the best physician was the one who committed the fewest errors in diagnosis. How was this done? The physician who never for a moment forgot the distinction between what he knew and what he only thought he knew would not go far wrong. But if as he grew older and vainer he refused to admit that he was fallible, his mistakes would multiply. A physician who in the hubbub of success had lost his humility was not a safe guide.

A kind of success could be won in both professions by the "gift of the gab." He supposed that the greatest danger to the doctor's integrity of mind was the credulity of his patients. A friend of his, one of the ablest Ministers in the last Cabinet, once confided to him that at all times and in every ill he had found salvation in the manipulations of a certain gentleman, "I forget now whether he twisted his neck or merely pulled his leg." Was the quality of credulity entirely lacking from the audiences which hung on the words of politicians in Parliament and in the country? Was it not true that in a democracy the gift of public speech had an undue advantage over other qualities? And if the credulity of the public was a snare to both professions, what was the remedy? It could only be the education of public opinion.

> "Will medicine and politics go forward into the future in step? I wonder. Medicine is becoming more scientific. The glittering victories she has won in the field of bacterial disease by the discovery of penicillin and by the use of sulphonamides have enriched our resources. The physician of to-day is twice as well equipped in the war against disease as he was when I was a student. The physician who knows what is wrong with a patient and has an effective remedy in his hands can 'cut the cackle.' He has no need of it: The doctor's patter has been the subject of ridicule from Molière to Bernard Shaw, but the profession has been weaned from this patter because it has been armed. The task of the politician is less simple. Even more than the doctor he has to deal with the vapours in man's mind. . . . But let me end my comparison of politics and medicine with this admission, that while medicine has riveted the attention and absorbed the energies of some of the ablest of our race, the government of man, which is the business of politics, is the greatest of all human studies."

Responding to the toast of the guests, proposed in a speech of commendable brevity by Dr. John Parkinson, Harveian Orator, the ARCHBISHOP OF CANTERBURY, who enlightened the occasion with a wit that delighted everyone, referred to his close connexion with the King's School at Canterbury, mentioning that he had only discovered that afternoon that two old boys of that school bore honoured names in the early history of the College. One was Thomas Linacre, founder and first President, and the other was William Harvey himself. Both of them were also Oxford men—one a Fellow of All Souls' and the other Warden of Merton, the two Colleges of which the Archbishop of Canterbury was always Visitor.

They were all thankful, the Archbishop went on, that medicine could now turn from salvaging the wreckage of fratricidal war to peaceful and constructive tasks. The medical profession had always been governed and disciplined by the zeal for scientific truth, the passion to serve society, and the sense of personal vocation. "Although we expect the members of the medical profession to know their job scientifically and to serve the public well and skilfully, what in the end we treasure most about them is something in their character which is the proof of their personal vocation and devotion, and we all pray that that may never grow less in this great profession."

Mr. ERNEST BEVIN, the Foreign Secretary, who also responded, said that this was not his first experience of the College. He had attended an earlier dinner in which he had ventured to ask for the help of the members of the College in industrial health and welfare, and he expressed his appreciation of the progress made in that field, although it was not so much as he would have liked. He also referred to the work done by the joint committee of the Trades Union Congress and the British Medical Association, which he thought had done a great deal to bring the medical profession nearer to men and women at their work. A tragic shortage of efficient man-power would

exist in this country for several years to come. This was due to two causes—the losses of the last war, which were now being felt in the scarcity of responsible men between the ages of 45 and 55, and the losses of this war, as measured not only in life but in interruption of training. The devastation in Central Europe, the loss of productive capacity all over the world, the tremendous wealth of the United States, the enormous power of Russia, all made it evident in different ways what a great burden was laid upon the British people if British leadership was to be maintained. During the next twenty-five years they could not afford to lose a single productive unit. "I know that you as one of the great professions will cast aside any prejudices you may have, and just as you flung everything on the altar to resist the enemy, you will place your great ability to the fullest extent to the common service in order that this country may survive and still play its part in human destiny."

RHEUMATIC FEVER AND HEART DISEASE

The annual Harveian Oration founded by William Harvey in 1656 was delivered on Oct. 19 at the Royal College of Physicians of London by Dr. John Parkinson, physician to the cardiac department of the London Hospital and to the National Heart Hospital.

Dr. Parkinson said that Harvey, by his discovery of the circulation, confined to the blood and the blood vessels the evil humours of early writers which were regarded as the cause of rheumatism. In the 17th century rheumatism was differentiated from gout; in the 18th century rheumatism was first recognized as being associated with the heart, and in the 19th century this association was confirmed.

Rheumatic fever of childhood was the main source of heart disease up to the age of 40. The damage was done between the ages of 5 and 15, and it exceeded tuberculosis as a cause of death to the age of 20. During this war, as in the last, large numbers of our young men were found unfitted for service because of valvular disease of the heart directly due to juvenile rheumatism. It was estimated that almost one-tenth of all rejections were on account of heart disease. In peacetime the economic loss each year could be judged by the fact that the duration of economic activity in these men was no more than ten years on the average. All were agreed that poverty and overcrowding were basic causes, and rheumatic fever was rare among children of the well-to-do. Anything a Government did in these directions would reduce the incidence of rheumatic heart disease.

Dr. Parkinson said there was almost unanimous opinion that compulsory notification of rheumatic fever was essential to progress, for it would permit its early diagnosis before heart disease had taken hold. The excellent scheme for rheumatic children now in operation by the London County Council was regarded in the United States and elsewhere as the most comprehensive in existence; but doctors knew, and the public should know, that institutional treatment from the outset, and subsequent supervision, would have to be extended to every case of rheumatic fever occurring in this country. There should now be created a Rheumatic Fever Committee to co-ordinate research and plan for the future. The Orator believed that the Royal College of Physicians was prepared to take a lead in this great endeavour. The objective should include one main country hospital for research, and hospitals and clinics to serve all densely populated areas. Ultimately it would be found necessary, as it had been in the United States, to create a National Council for Rheumatic Fever and Heart Disease.

HEBERDEN SOCIETY MEETING

The Heberden Society will begin its first post-war academic year with a two-day meeting in London on Friday and Saturday, Nov. 2 and 3. This clinical and scientific society, founded in 1936 for the advancement of the study of rheumatic diseases, and closely associated with the Empire Rheumatism Council, has been so reorganized that membership is now drawn from all centres in the British Isles, notably the universities and spas. The inaugural general meeting, which is timed to coincide with part of the post-graduate course arranged by the Empire Rheumatism Council (see *Journal*, Oct. 13, p. 516), opens on Nov. 2 in the rehabilitation unit of the Royal Free Hospital at 4 p.m., when during tea there will be exhibits. A short business meeting will be followed at 4.45 p.m. by a lecture-demonstration on recent advances in physical methods by Dr. C. B. Heald in collaboration with Fl. Lieut. B. C. Elliott, Dr. Graham Weddell, and Sister F. L. Greenhill. (Medical practitioners attending will be welcomed to tea, provided they apply for a tea invitation to Miss Bereton, 91, Priory Road, West Hampstead, N.W.6.) On the same evening the members will dine at the Euston Hotel. On Nov. 3 at 10 a.m. at the Middlesex Hospital Prof. R. Windeyer will give a lecture-demonstration on the treatment of ankylosing spondylitis by *x* rays.

BRITISH CIVILIANS RELEASED IN CHINA

We have received from the War Organization of the British Red Cross Society and Order of St. John of Jerusalem a preliminary report—dated Sept. 11, 1945, Shanghai—on the British inmates of civil assembly centres. The author is Dr. W. S. Flowers, the War Organization's medical superintendent in China.

Health of the Inmates

The physical condition of the 5,570 internees in the several internment camps is surprisingly good. Despite crowded living conditions, some deficiencies in diet, and inefficient and uncertain sanitation (which in Ash Camp was found to be both primitive and inadequate), no serious epidemic diseases have broken out. There has been a good deal of malaria, particularly in Lunghwa Camp, where a very unreliable water supply could be maintained only with much labour and worry, and where 45% of the interned had one or more attacks of malaria. Yangtzepoo Camp has had a mild epidemic of amoebic dysentery, while all camps have had dysenteric diarrhoea. One camp had an epidemic of whooping-cough which affected most of the children. There have been recently a few sporadic cases of encephalitis japonica, from which the mortality among the stateless outside the camp has been as high as 75% but has not so seriously affected the internees in Allied camps. Otherwise the physical condition of the people, including the children, has been well maintained. This has been largely due to the untiring labours, vigilance, and medical nursing care provided by a fine team of doctors and nurses in each camp, and dental facilities were made possible by a good team of dentists. Equipment was limited and supplies were often short, but by improvisation and local purchases an amazing medical service was developed and maintained.

The figures under a rough-and-ready classification are as follows: Ash Camp, 424 persons; Yangtzepoo, 1,122; Pootung, 881; Lunghwa, 1,538; Chapei, 703; Lincoln Avenue, 295. Up to the present we have no report from Yangchow (total 607), but anticipate that the internees there will be in equally good health.

While the physical condition of these people is good, they are all obviously very tired, many have lost a good deal of weight, the majority are definitely anaemic, and all are eager to escape from "camp life" as early as possible. The camp mind and outlook is psychologically interesting: memory is unreliable, and outlook and interests have been narrowed. The mortality has been low—if anything lower than it would have been had these people been living the normal rushed life of civilization. The majority of deaths have been among the aged from natural causes. There has been no typhus, typhoid, or cholera.

Nutrition, Housing, and Recreation

Nutrition has varied considerably from week to week. The average level was above 1,700 calories per head. Occasionally it fell below this as a punishment for escapes or attempted escapes. Fats were not very plentiful, milk for the children was always in short supply—generally about 6 oz. could be allowed daily to them. Adults often went short to maintain the best standard possible for the young, who are uniformly in pretty good shape. Detailed charts of the nutrition show peak periods when parcels came in and low periods when punishment was meted out. Recent liberal supplies from United States sources have adequately supplemented all previous deficiencies. Vitamin extracts have generally been sufficient to make up for other shortages.

The accommodation provided allowed 40 sq. ft. per person. The barrack-like buildings which were converted into dormitories allowed of little privacy, only curtains dividing the families. For the large majority there was obviously no escape from the crowd by day or night. Most places had room for some recreation, but Jap guards prevented any wandering over the fences. They would not allow the preventive units formed to wander into the paddy fields to prevent the breeding of the mosquitoes responsible for so much malaria. Sanitation was rarely very good, and only by the labours of the internees themselves was some hygiene maintained. The kitchens where they worked in shifts for the cooking of their own food were very primitive and must have demanded incessant effort to keep clean. Water supply, except at the Lunghwa camp, was generally good.

Recreation fields were laid out where there was room by their own labours. Football and tennis were possible part of the year. Exercise was practised by all at first, but towards the end few had energy for it. Schools for the children were run in the camp by a band of teachers, and the children sat their exams. even up to matriculation. Lectures, concerts, plays, and opera filled in the evenings, and there were few signs of boredom. It all represents a refusal to be hindered by circumstances from pursuing a free and enjoyable life.

Summary

The health record is good. All are tired, many are anaemic, and many are affected to a greater or less degree by psychological changes. Conditions were favourable for large epidemics, but none developed.

Malaria could not be prevented in view of Japanese control, but was adequately treated. Morale was maintained throughout, despite the mixed community assembled together in such close proximity and lacking all privacy, by the efforts of enthusiastic leaders, teachers, and entertainers.

Reports of Societies

INTERNATIONAL BIOLOGICAL STANDARDS

DIXON MEMORIAL LECTURE BY SIR PERCIVAL HARTLEY

The Walter Ernest Dixon Memorial Lecture was delivered in the Section of Experimental Medicine and Therapeutics of the Royal Society of Medicine on Oct. 9 by Sir PERCIVAL HARTLEY, Director of Biological Standards, Medical Research Council. Dr. E. H. ALLOTT presided.

After a tribute to Dixon, one of the earliest advocates of the biological standardization of drugs, Sir Percival described a biological standard in its simplest form as an arbitrarily chosen but representative sample of the substance for which it was to serve as a basis of measurement, preserved under conditions ensuring its permanence. A unit might be defined as the specific biological activity contained in a certain weight of the standard. The first biological standard to be established was for diphtheria antitoxin, the discovery of which by von Behring was announced in 1890. Then followed Ehrlich's remarkable series of researches, amongst the most famous in immunology, which laid the foundation of biological standardization as it was known to-day. The supply of standard diphtheria antitoxin from Ehrlich's institute at Frankfurt ceased with the outbreak of war in 1914, and this withdrawal rapidly led to the establishment of the standard on an international basis and to the creation and adoption of international standards for other substances.

In 1921 an international conference in London recommended the adoption of Ehrlich's original unit as the international unit, and in the following year a second international conference in Paris explored the possibility of establishing standards and units for other antitoxin and antisera. As an outcome of this and later conferences international standards for digitalis, pituitary (posterior lobe) extract, insulin, and the arsphenamines were adopted, and a Permanent Commission on Biological Standardization was set up by the Health Organization of the League of Nations to provide international standards and units and to secure their widest acceptance. Within less than twenty-five years 35 international biological standards had been established, and even during the recent war progress had not stopped, for standards for vitamin E (1941), heparin (1942), and penicillin (1944) had been adopted during that period.

International Achievement

The materials for biological standards had come from many countries, but in all but seven of them the final operations to secure conditions of permanence and stability had been carried out in England, and for all but two of these at the National Institute for Medical Research, Hampstead. Five of the original international serum standards were made at Hampstead, and a number of equivalent international standards had also been made there for the purposes of the Therapeutic Substances Act and the *British Pharmacopoeia*. To illustrate the international character of the work, the lecturer mentioned that material for the serological standards was supplied from England, Denmark, and the United States; the tuberculin standard was made in England; material for the vitamin standards came from Switzerland, Dutch East Indies, Hungary, England, France, Germany, Sweden, and the United States; that for the arsphenamines originally from Germany and the United States and later from England; the first insulin standard was made in England and the second in Canada; the material for both pituitary (posterior lobe) standards was supplied from the United States and manipulated in England; the first digitalis standard was prepared in Holland, the second in England; ouabain standard material was supplied from France; materials for the sex hormones were supplied from eight countries; Canada provided the material for the heparin standard, and the United States and this country the material for penicillin.

Practically all the material for these standards was presented to the international organization, some of these gifts representing very large sums of money. A laboratory in Switzerland presented 30 grammes of androsterone to provide the replacement standard for male hormone activity; a laboratory in England presented 20 grammes of the purest beta-carotene to provide a replacement standard for vitamin A, and another presented 30 grammes of pure crystalline penicillin sodium salt for the standardization work in Hampstead. Free distribution was made of all standards issued from Hampstead, on a national basis or to the British Commonwealth or to individual research workers anywhere, as for the international standards.

Standard for Penicillin

After recounting the course of events which led to the adoption of international standards for vitamins and the subsequent action in this field, Sir Percival Hartley turned to the latest standard, possibly the last, established by the Permanent Commission—namely, the international standard for penicillin. For many reasons, he said, it was desirable that an international standard for penicillin and an international unit defined in terms of it should be agreed and established without delay. Delegates from five countries with expert observers from certain others met in London a year ago under the chairmanship of Sir Henry Dale, and unanimously recommended the adoption of a sample of pure sodium salt of penicillin II as the international standard, and, for practical reasons which were justified at the time, a sample of a calcium salt of penicillin as the international working standard. The international unit was defined as 0.6 microgramme of the international standard, and such unit was contained in 2.7 microgrammes of the international working standard. Decisions as to nomenclature and other matters were also recorded by the conference.

At Hampstead they were now almost ready for the final stages of giving effect to these decisions by the world-wide distribution of penicillin standards. He exhibited a sample of the international standard, mentioning that at Hampstead they had over 300 such small containers, each holding about 30 milligrammes; also a sample of the International working standard, of which they had 200 containers, each containing about 65 milligrammes. The actual international standard preparations obviously could not be used for the routine assays of penicillin; there were not enough of them; but they were supplied for the assay and periodical check-up of equivalent national standards which the national control centre of each country was expected to prepare.

The Oxford Unit

The first standard for penicillin was made at Oxford, and the unit of activity, which came to be known as the Oxford unit, was defined as that which was contained in 0.23 milligramme of this preparation. In one way or another the original Oxford unit had been redetermined in many other, more active preparations. At Hampstead they were provided with two such accurately assayed preparations—one containing 71 and the other 84 units per milligramme—and with these the potency of the British standard for penicillin—155 units per milligramme—was assayed. These three preparations, with two others from the United States carrying the Oxford unit, were included in the samples examined by the London conference a year ago. The results of the assays, despite the different methods employed by the collaborating laboratories, showed remarkably good agreement. There was sound evidence that the value of the unit which was being used a year ago in the United States was the same as the value of the unit being used in this country; from which it certainly seemed that, in

spite of the repeated redefinition of the unit in both countries, the original value as defined at Oxford had not been significantly varied. Finally, the value of the unit recommended for international adoption was approximately equivalent to that originally adopted at Oxford.

Impending Developments

Sir Percival then discussed the important part which international biological standards had played in ensuring the high quality of therapeutic substances. The Therapeutic Substances Act had for nearly 20 years controlled the supply of certain drugs and medicaments, but it was limited in scope and in geographical application. For example, its control did not extend to the vitamins or heart drugs, and its application was restricted to Great Britain and Northern Ireland. A way had been found, however, whereby both these limitations might be overcome—namely, by including all the substances for which international biological standards had been established in the *British Pharmacopoeia*, and the *Pharmacopoeia* on its part had laid down the principle that the standards and units to which pharmacopoeial preparations must conform were the international biological standards and units. In some parts of the British Commonwealth and Empire a control over these substances similar to our own had been established, and in these countries also international standards were in general use.

After describing the interesting replacement operations which had taken place from time to time in respect of 18 of the 35 standards, including the first insulin standard and the first standards for pituitary (posterior lobe) extract and for vitamin B_1, the lecturer said it was quite likely that a new international organization which might replace the Permanent Commission of the League of Nations would decide that standards for antisera and some of the antitoxins could be dispensed with, and that arsphenamine—the original "606"—had earned an honourable retirement. The position of vitamin standards might also come under review. As Sir Henry Dale had picturesquely put it, "The ultimate aim of biological standardization, as of all preventive medicine, may be regarded as self-extinction." But there were new candidates with good claims to admission. The standardization of the diphtheria prophylactics was a problem of outstanding importance and urgency. The establishment of an international standard for tetanus toxoid for the active immunization of man might well have an early priority. Some of the investigations carried out at Hampstead regarding the standards for and the assay of gas-gangrene antitoxins, which became urgent and important because of the immediate needs of the war, also indicated new directions in which the work of biological standards might develop.

International biological standards might find useful application in the rapidly developing field of chemotherapy. Pure substances could, as a rule, be fully described in chemical and physical terms, the doses to be administered could be expressed in weight, and biological standards and units were neither necessary nor desirable. It was otherwise, however, in the case of substances of proved biological activity and clinical usefulness of which the chemical composition was unknown, and successive batches of which possibly exhibited varying biological properties. For such substances, in the interim period pending the discovery of their chemical composition and structure, or perhaps of a more reliable process of manufacture, experience had shown the value of the adoption of a standard by comparison with which other preparations could be matched.

THE "DISCHARGING LESION" IN NEUROLOGY

At a meeting of the Neurological Section of the Royal Society of Medicine on Oct. 4 the new president, Dr. J. Purdon Martin, delivered a presidential address on the subject of the "discharging lesion" in neurology.

The theory of the "discharging lesion" was propounded by Hughlings Jackson to account for convulsive phenomena, but Dr. Martin considered that it was capable of a wider application in neurology than had hitherto been accorded to it. The theory postulated that nervous tissue (and therefore nerve cells, inclusive of their axis cylinders) "stored up" energy, and under the influence of physiological stimuli some of this energy was emitted in an orderly and controlled manner as impulses, but that under certain abnormal conditions the energy might be discharged without a physiological stimulus, and then in an excessive, uncontrolled, and disorderly fashion. A portion of nervous tissue which was in a pathological state such that it was liable to discharge in this manner constituted a "discharging lesion." Modern physiological knowledge lent much support to this theory, and he (Dr. Martin) had in fact come to it chiefly by way of the physiology of muscle.

Jackson was mostly occupied with convulsions, but there were many other phenomena which provided objective evidence of "uncontrolled" and apparently unphysiological discharges (some of which Jackson had referred to in his writings). Observation led to the belief that discharges might be of three different degrees or varieties, which, however, graded into each other. The convulsion was evidence of a massive or explosive discharge. The smaller repeated discharges which would give rise to peripheral facial spasm, or to the muscular fibrillation of amyotrophic lateral sclerosis, might be described as "spluttering," while those that caused continuous spasm of muscles such as trismus might be called "continuous." There was evidence of a still lesser degree of abnormal instability in certain conditions in which there seemed to be an excessive motor response to normal stimuli, as in some of the motor phenomena of tetany and of tetanus and of strychnine poisoning.

Jackson considered that symptoms attributable to "spontaneous" discharge were essentially paroxysmal and transient, since the portion of nervous tissue from which the "primary" discharge occurred required time to become again "overcharged." While it was true that the phenomena indicative of massive discharge were transient, those attributable to "spluttering" and "continuous" discharges might go on for a long time, and in some instances for the rest of the patient's life. Trismus and tetany were actually continuous, while peripheral facial spasm might be said to be paroxysmally continuous. In regard to all of these we must suppose that in the discharging nervous elements the store of energy on which the discharge depended was being renewed as quickly as it was expended. A similar condition of energy exchange could be maintained and demonstrated in muscle, and was known as a "steady state." The peripheral facial spasm which occurred as a sequel of Bell's palsy was associated with an imperfectly recovered nerve. The fibrillation of amyotrophic lateral sclerosis was associated with a degenerative state of the anterior horn cells.

We might apply, Dr. Martin continued, what we have deduced from observation of the motor phenomena to the interpretation of certain sensory phenomena which patients described. After a vascular lesion of the thalamus, imperfectly recovered cells of the "pain system" might constitute a discharging lesion and achieve a steady state, thus giving rise to the spontaneous pain of continuous nature that was the characteristic after-effect of such a lesion. In other cases the degree of recovery might be such that the cells did not discharge spontaneously, but their "energy substance" remained hyperexcitable (e.g., in consequence of anoxia) so that they reacted excessively to normal stimuli. The alternative theory—that the "thalamic syndrome" resulted from a release of the thalamus from a control normally exerted over it by the cerebral cortex—was not in keeping with some of the essential facts.

In the case of a recovering sensory nerve (as in that of the recovering facial nerve) there might be a state of instability of the energy substance, and this might be the basis of that hyperalgesia which Head attributed to "protopathic sensation."

Lightning pains in tabes were attributed to discharges occurring in degenerating afferent elements. If a discharge arose in the afferent portion of a reflex arc it might give rise to reflex movements. All the organs liable to be affected by visceral crises were reflexly controlled, and such a crisis might be due to "spluttering" discharges in the afferent part of the arc, producing the effect of an irritant or foreign body in the viscus concerned.

All these symptoms had something in common—namely, an excessive, "explosive," or compelling quality. The motor phenomena referred to had also this in common—that they might occur or continue during sleep. This applied to convulsions, facial spasm, tetanus, and tetany—whereas most

abnormal movements, such as those of paralysis agitans, chorea, and spasmodic torticollis, ceased during sleep. This difference might not be fundamental, because chorea had many of the features of a symptom due to "spontaneous" discharges.

The theory provided explanations for, and enabled one to see a certain unity in a number of symptoms for which the current explanations were unsatisfactory. Dr. Martin recalled a quotation from Pasteur: ". . . the characteristic of a true theory is its fruitfulness."

Correspondence

Telling the Patient

SIR,—Major J. C. Hogarth's letter on this subject (Oct. 13, p. 513) is timely and deserves more than a passing comment. Observations of the same kind have been made to me by a number of thoughtful Service medical officers—usually with unit experience—who have been frankly shocked by the impersonal methods which prevail in many Service and E.M.S. hospitals. I had frequent occasion to make similar criticisms, during the first three years of the war, as the result of my numerous contacts with E.M.S. and teaching hospital medicine.

How have these strange habits of thought and action, this routine of intensive and often repeated investigation and multiple specialist opinions, but with so little said and done for the patient *as a person*, come to characterize hospital practice? What is the function of the physician, what is the object of medicine if it is not to help the patient's mind and body in every way possible and at every stage of his illness? There can be no greater disservice than to leave him puzzled or in the dark. It is a sad reflection on the trends of our clinical teaching in recent decades that institutional medicine should now so frequently be allowed to degenerate into a kind of mechanical bedside pathology; that it should prefer reports and labels to human histories, and diagnoses and treatments to "treatment," and delight so selectively in what is called the "interesting" case. "Examination, explanation, and reassurance" should be as much in the mind of the student and young doctor as "inspection, palpation, percussion, and auscultation," if—that is to say—he cannot be human without a mnemonic.

In another letter in the same issue Wing Cmdr. Bergin comments on some of the consequences of the modern "passed to you, please" ritual of investigating and handling patients. What a travesty of our old clinical discipline it is to employ a succession of specialists to exclude organic disease and then to ask a psychiatrist to make the final diagnosis, and, too often, to confirm the invalidism. The technological age in medicine has added much to our investigatory powers and has done much for many patients, but it is time our science and humanism resumed a more equal co-partnership. Two books have recently been sent to me from the United States, where similar trends are, I gather, all too common. One is called *The Patient as a Person* (by G. Canby Robinson); the other *Patients Have Families* (by Henry B. Richardson). We stand on the threshold of large reforms in our teaching and our practice. May we hope that the teachers of the new generation will take every occasion to remind their students and house-officers that "patients" are, above all, "persons" and not just "cases," and also that they have families and that they get better more quickly or accept their adversities better if they and their families are simply and clearly told what they most need to know?—I am, etc.,

Oxford. JOHN A. RYLE.

SIR,—How cordially I agree with Major Hogarth's suggestion that the patient be given constructive information about his complaint. I would go further, and suggest that therapy is incomplete until the disease is evaluated to him in terms commensurate with his intelligence, education, and emotional maturity, and until he is helped to adjust to it.

One of my first lessons in psychotherapy—from Dr. T. A. Ross; I have never forgotten his advice—was that the patient should be completely overhauled physically and the nature of his physical complaints precisely delimited and evaluated to him. How much more important, surely, where the complaint is predominantly physical; or in the extending field of the psychosomatic complaint—i.e., the physical symptom due to emotional stress.

Hypochondriasis is due to—or at any rate encouraged by—ignorance or fractional knowledge. It is surely the function of the doctor—specialist or G.P.—to dispel that ignorance. In doing so he will tend to clarify his own clinical conceptions and amplify his own therapeutic influence; by failing to do so he may become the creator of suffering. In doing so he will also help dispel the suspicion—explicit in many intelligent laymen and implicit in many more of their less articulate brothers—that much of the doctor's business is a defensive jiggery-pokery of false magic.

The doctor who has not the patient's full trust is crippling his own therapeutic influence. That trust can be more easily gained if a more rightful conception of the doctor's business is encouraged: that his influence is based, not on symbols, prestige-attitudes, or an implicit claim to a higher esoteric level of understanding, but on compassion fused with skill and experience and the ability to help the patient to see his complaints in their proper perspective.

Much avoidable psychotherapy, suffering, and distrust of the medical profession could be prevented if more doctors—specialist or G.P.—were to spend the few moments necessary to complete their therapeutic effort by bringing the patient "into the picture." It would also help those of us who come after to get a reasonable medical history. I am continually being surprised by the number of intelligent young officers who have vague ideas about quite serious illnesses and who are naturally worried because no one has told them what to expect or what to do about it.—I am, etc.,

Witley, Surrey. H. HARRIS, Major, R.A.M.C.

SIR,—Major J. C. Hogarth (Oct. 13, p. 513) surely realizes that in the out-patient department of a hospital the patients are referred for an opinion by the general practitioner. The majority of these practitioners, I am sure from personal experience, would resent the out-patient physician discussing in detail the diagnosis, prognosis, and treatment with the patient. This is the function of the general practitioner, and it is the physician's duty, in my opinion, to communicate only with the doctor concerned. Only in exceptional cases and at the doctor's request should the physician discuss the diagnosis with the patient. Otherwise, surely, essential trust and harmony between patient and general practitioner are apt to be jeopardized.—I am, etc.,

Northwood, Middlesex. E. IDRIS JONES.

Rehabilitation of Fractured Limbs

SIR,—The letters of Dr. R. Murray Barrow (Sept. 8, p. 332) and Dr. Vaughan Pendred (Oct. 6, p. 475) prompt me to point out that in 1899, when a student at Edinburgh University, I demonstrated to Prof. Annandale and Mr. J. W. Dowden at Edinburgh Royal Infirmary an electrical method of producing controlled contractions and relaxations of any of the muscles of the body. With their assistance I treated various types of fractures, particularly Colles's fractures, the latter being put in plaster and the case split in four to eight days; then daily contractions of the extensor and flexor muscles were produced by the apparatus described, so as to cause movements of the wrist and fingers. I showed that contractions and relaxations were so finely controlled that only the slightest movements of the muscles were discernible at first, and gradually increased to the maximum required without pain until the wrist and fingers were put through their full range of movements. About the year 1905, when I was in charge of the *X*-ray Department of Great Ormond Street Children's Hospital (which I started as a department), I showed the same method to Sir Arbuthnot Lane and Mr. Stansfield Collier, who were so impressed with the results that they sent many of their fractures to me for treatment by this method. In spite of the recent literature advocating long periods in plaster I have continued to carry out this method with consistent success, and full functional use of the wrist is obtained in much shorter time than when treated by the present-day so-called orthodox method.

By the method I advocate, which has stood the test for so many years, an important factor is that the muscles can be

made to contract and relax painlessly *without their point of origin being approximated*, so that considerable movement of muscles in the initial stage of treatment can be carried out without moving the fractured ends of the bone in the slightest degree. This reproduction of the function of the muscles in the neighbourhood of a fractured bone by graduated contractions acts beneficially in the following manner: (1) The contractions and relaxations gradually increase the local blood supply and aid its circulation, so that absorption of lymph and extravasated blood in the tissues is rapidly promoted and the growth of callous powerfully stimulated. (2) Slight movement at the broken ends may increase the production of granulation tissue by causing hyperaemia. (3) The movement of the muscles prevents contiguous muscles, tendons, and other structures from becoming adherent. (4) The reproduction of the physiological action of the muscle prevents their becoming atrophied. (5) By the muscle movements increasing the local blood supply, the resting bone is less likely to become atrophied. (6) By preventing adhesions and wasting of muscles, as soon as the repair of the bone is sufficiently advanced, the patient is able to regain full function in the limbs very much sooner than is possible where adhesions and wasting of the muscles result from enforced complete rest.

I can claim for this method that, if properly carried out, there is no danger and that the results in time and restoration of function are most satisfactory.—I am, etc.,

London, W.1. MORTON SMART.

Sciatic "Neuritis

SIR,—Dr. J. MacDonald Holmes and Mr. B. R. Sworn's article on sciatic neuritis (Sept. 15, p. 350) will be of great interest to all who have to try to deal with the problem of sciatic pain. But I still think that an injured intervertebral disk might account for their cases, both of which gave a history of associated trauma, for what that is worth. It is possible to envisage injury to the attachment of part of the annulus fibrosus, allowing a local bulging of the disk in the standing position which would be absent in the position at operation, and where no softening or break in the posterior contour of the annulus would be felt. I am uncomfortably aware that this explanation is highly suppositive. But I feel we should be unwilling to abandon a pathological concept which has shed so much light on sciatic pain, unless logic truly demands it.

Symptomatic relief from decompression is understandable with any pathology. But if the disk is damaged, further protrusion in the years to come might be expected. It will be interesting to know if either symptoms recur as the protrusion again fills up the extra space provided, or a demonstrable narrowing of the disk space occurs.—I am, etc.,

C. W. M. WHITTY,
Major, R.A.M.C.

Psychiatry in the Services

SIR,—As a practising psychiatrist it is with much regret that I find myself in agreement with most of the statements in Wing Cmdr. K. G. Bergin's letter (Oct. 13, p. 508); for, having myself served as a unit medical officer, I realize that there is no lack of confirmatory evidence regarding the facts mentioned. I have no doubt that the majority of unit medical officers could cite an infinite number of similar cases, and I am sure that many other correspondents will be only too glad to recall their own experiences. Personally, however, I am much more concerned in striking at the root of the trouble, and, though willing to admit that there are many first-class psychiatrists serving in the Forces, I do not agree with Wing Cmdr. Bergin's statement that the psychiatric branch can be exonerated from all blame in the matter of the treatment and disposal of such cases. It must be admitted that, owing to the shortage of trained psychiatrists, it was inevitable that the original selection of personnel for this branch was a matter of great difficulty, and, for the same reason, it was impossible to give these officers an adequate military training. It is, indeed, a well-known fact that, especially in the early part of the war, many "specialists" were appointed though there was scant evidence that they possessed more than a superficial knowledge of their "specialty."

In my opinion many of the difficulties confronting even the expert neuropsychiatrist would have been obviated if these specialists had been posted for an adequate period as ordinary unit medical officers. They would then realize to the full the actual conditions under which Service personnel—especially N.C.O.s and other ranks—live and work. This, I believe, is the crux of the whole problem, and raises a matter which is of vital importance to the future of psychiatry. Although he is obviously viewing the matter from an entirely different aspect, I think that Wing Cmdr. Bergin sums up the situation very concisely in the clause: ". . . a system which lays too much stress on psychological illness and not enough on a man's responsibility to his fellows." It is obvious that he did not intend this to be an indictment against psychiatry, but we who profess to be psychiatrists would do well to ponder and give the matter much consideration. In the past too much stress has been laid on the academic and scientific aspects of psychological medicine, and the sociological implications have not received the attention they deserve. This broader view can be achieved only when psychiatry is accepted as an integral part of the social service of the community and not segregated as a little-understood and narrow specialty.—I am, etc.,

St. James Mental Hospital, Milton, Portsmouth. W. LIDDELL MILLIGAN.

SIR,—Wing Cmdr. K. G. Bergin's experience (Oct. 13, p. 508) differs entirely from that of all serious writers on the subject of Service neurotics in two respects—their progress after invaliding and their response to disciplinary measures. Careful follow-ups on patients who had been invalided out of the Services for neurosis were done by Lewis (*Lancet*, 1943, **1**, 167) and Ferguson (*Health and Industrial Efficiency*, H.M.S.O., 1943), it being found that the great majority were still seriously incapacitated after months of civilian life. I have encountered many patients of this type who had been harshly dealt with by the executive because of their failure to meet the demands made upon them or their supposedly malingering propensities. In each case the results were disastrous, and a completely useless individual, often with a very great nuisance value, was produced. Such eminent psychiatrists as Ebaugh (*Manual of Military Psychiatry*, W. B. Saunders, Philadelphia, 1944) on the other side of the Atlantic and Hadfield (*British Medical Journal*, 1942, **1**, 281) on this have emphasized the unfortunate consequences of treating these patients as malingerers. Neurotic symptoms are very real, and the man or woman in a state of pathological anxiety and depression finds it more difficult to lead a normal active life than does a healthy person. A refusal to recognize this produces a strong sense of injustice and grievance and has a most harmful influence.

That the object of neurotic behaviour is to procure discharge from the Service is a dangerous half-truth in so far as it implies that this is the chief or sole *raison d'être* of the illness, and that it will cease as soon as it is made quite clear that there is no chance of this end being achieved. In fact the genesis of these states is complicated in the extreme, and in most cases the neurotic behaviour cannot be stopped by any method known to man.

Wing Cmdr. Bergin's examples are completely unconvincing and indicative of a disarmingly naive outlook. For example, the ability to cycle home and work in the garden with every appearance of pleasure does not in any way suggest that the man's distress when required to work overtime is feigned or exaggerated.

It is obvious that Wing. Cmdr. Bergin has let his judgment and interpretation of the facts be influenced by his moral indignation at the gain which the neurotic may derive from his illness. This gain is a common phenomenon in civilian life also and by no means confined to conditions of military conscription. The only way to prevent this secondary gain in the circumstances would be to gather the neurotics into special units, which would probably serve little useful military purpose and whose chief function would be to keep the personnel on Service pay and living under camp or barrack conditions, so satisfying the code of morality which Wing Cmdr. Bergin advances and which will command widespread approval. These units would require efficient administrative staffs, which would be hardly justifiable from the point of view of the national interest in time of war. The "system" which is castigated is presumably that of invaliding on medical grounds for neurosis. From the moral point of view there is much to be said for the

American system of discharge on the grounds of inaptitude. Not that I personally would agree that our present system is immoral.

The grossly unsatisfactory state of the treatment of neurosis at the present time arises out of the stubborn and intractable nature of these pathological emotional disturbances. Light-hearted superficialities will not help in the solution of this problem.—I am, etc.,

Cheshire. A. HARRIS, S/Ldr.

SIR,—I have read Wing Cmdr. Bergin's letter, and there is no doubt that his remarks are only too true. It has been my unfortunate lot as a station medical officer to have to deal with a vast number of these cases, and his description and subsequent history are correct in every detail. Many station medical officers with whom I have discussed this type of case are agreed that the approach and handling are wrong, but unfortunately they have no other way of dealing with them. The solution suggested by Wing Cmdr. Bergin—i.e., Do your duty or take the consequence—is of course the solution to the whole problem; but unfortunately it is not so easy as that. I have tried that myself successfully on occasions; but from time to time political influence has been used and instructions issued from higher authority that the patient is to be dealt with in a certain manner. These instructions are issued by someone who has never seen or examined the patient and without consulting the station medical officer. After much thought I have come to the conclusion that the vast majority of these patients are devoid of all sense of duty and are sickened only by selfish thoughts.

The only solution is courage—courage on the part of the medical branch to stand by their convictions; courage among the higher authorities to stand by the medical branch and to say so publicly; and, lastly, courage in the hearts of the weak and selfish to face the slings and arrows.—I am etc.,

G. F. MAGURRAN.

SIR,—Wing Cmdr. Bergin seems to be passing through one of the phases common to medical officers. Even the kindest M.O. is apt to feel annoyed when he discovers what he fancies is a leg-pull, and he naturally relieves his feelings by a more or less indiscriminate outburst of severity, rationalized in whatever way appeals to him. A few M.O.s become congealed in this phase, or its opposite extreme of leniency, but the majority gradually settle down to a middle course as they grow more able to discriminate and less afraid of being wrong. It is perhaps better to be fooled occasionally than to be unjust to an honest man. Even the irritation of being informed—with relish—by a non-medical officer that a man for whose story one has fallen has been heard boasting of his successful deception may be soothed by the reflection that this is by no means proof of malingering.

As to the methods in vogue for separating the wheat from the tares, they fall into three classes: (1) "The Sign from Heaven," otherwise known as clinical intuition or diagnostic acumen. (2) "The Geographical." Certain parts of the British Isles seem to maintain steady streams of "bad eggs" to the Services. Wild horses would not induce me to name my own favourite black spots. (3) "The Police Method," which relies on "information received" and on catching the accused out in contradictory statements.

By a judicious combination of these methods, supplemented by *very* occasional disciplinary action, it should be possible to keep the lead-swinging rate within reasonable limits. The picture that Wing Cmdr. Bergin paints of neurotics "almost without exception" deteriorating steadily and being invalided out is quite outside my experience in the Army. It certainly need not happen, and if it does it must be—in spite of his statement to the contrary—the fault of psychiatrists, unit medical officers, or the executive.

The moral issue, to which your correspondent refers, is simple enough in theory. The measure of a man's sacrifice is the degree to which he disliked making it. War divides people into those who like it and those who don't. Those who like it go willingly, knowing the risks and discomforts; they are the lucky ones, and they have their reward. They make the best soldiers, of course, but to be quite fair they should clearly not be allowed to get away with it; if fairness were the only consideration, they would sternly be directed into offices, factories, or other occupations uncongenial to them, so long as other people are forced into the Army against their will. Fairness, however, must come second to efficiency, and even if it did not it would be impossible to be fair to everybody. And since we cannot claim to be fair, it is difficult to see how we can demand "duty" and "moral responsibility." Such words have their cynical uses, of course. But we like to be fair in our thoughts even if we cannot be fair in our actions (at least we think we like to), and we cannot be so unless we realize that the man whose dislike of service is sufficient to drive him to decisive action, whether that action take the form of desertion, malingering, or the development of neurotic symptoms, is getting, or has had, a raw deal by comparison with his better-adapted comrade. This is no place to enter into futile arguments as to who suffers most—the man who protests or the man who would like to but doesn't. Sufficient has been said to make it clear that moral superiority is not an attitude which becomes us.

The system of which Wing Cmdr. Bergin complains is not intended to encourage escape, but it does recognize the essential pig-headedness of human nature. At a certain point unwillingness converges to inability, for practical purposes, and it pays better to take what the man will give rather than break him because he will not give you all you want.—I am, etc.,

Cambridge. W. E. HICK.

SIR,—I have been reading with interest Wing Cmdr. Bergin's letter. The cases in which he thinks he has failed in that by their "unconscious deception" they have got themselves discharged from the Service are in my opinion his most brilliant results, in that the square pegs have found for themselves the square holes for which by temperament and capabilities they are evidently suited. No work, I think, approaches in quality that which is done happily, with interest, with vim, and from free choice. Disgruntled workers are a potent cause of accidents in that their minds are upon themselves and their grievances rather than upon their work, and thus attention may be lacking at a vital moment.

I cannot emphasize too strongly the misery I have seen caused by labour direction to unsuitable jobs. One girl I know of went out of her mind through being directed away from her home as a mobile worker, which would never have happened if she had been left quietly alone in her factory job (which was turning out war material) in her familiar surroundings. In another case a man used to an open-air life was directed to coal-mining. When I saw him he was a miserable nervous wreck. This state was due to his being coerced into uncongenial employment, and, secondly, to his having seen an accident underground whereby two men were killed.

The tragedy of this war has been that men were forced into occupations for which they were never suited by either temperament or capabilities, and their nervous reserve becoming exhausted shows this by "the well-known features, etc.," which Wing Cmdr. Bergin describes: in other words, the square pegs protest at the round holes, and no amount of jamming them in by harsh discipline or fear will achieve more than a makeshift fit.

There are malingerers, we all know, but these of course are in a different category.—I am, etc.,

Bala. F. M. E. DAVIES.

Anaesthetic Risks

SIR,—I have read with interest the correspondence on the advantages and disadvantages of spinal anaesthesia. In your issue of Oct. 13 (p. 511) Dr. E. Falkner Hill writes a spirited letter in its defence, but his enthusiasm has led him into making a statement which appears to me questionable: "Inhalation anaesthesia acts by interfering with and to a greater or lesser degree damaging the cerebral cells."

We know, of course, that anaesthetic procedures which deprive the cortex of oxygen for even a comparatively short time do cause permanent damage to the cerebral cells, but does Dr. Hill mean that there is "a greater or lesser degree" of damage even when the oxygen requirements are fully met? If so, it would be interesting to know what scientific ground there is for this statement.—I am, etc.,

Dunfermline, Fife. A. C. DOUGLAS.

Significance of the Erythrocyte Sedimentation Rate

Sir,—Under the heading "Any Questions?" (Sept. 1, p. 307) the subject of E.S.R. has again been raised. Certain aspects of this problem were fully discussed in the correspondence which followed the paper by Della Vida (1942). In the course of a recent study we have found that confusion largely centres round the following points.

1. *Absence of a Standard Method of Performing the Test.*—Many writers do not state the method they employ. Presumably in such cases the test has been performed according to the original Westergren technique, in which 0.4 c.cm. of 3.8% sodium citrate is added to 1.6 c.cm. of venous blood. This may not necessarily be the case. For example, Dunlop and Dick (1944) employ dry potassium oxalate as an anticoagulant in what they term the Westergren method. Confusion would be avoided by describing the tests as "original Westergren" or "Westergren oxalate."

2. *Employment of Different Anticoagulants.*—Della Vida (1942) and Muller (1943) have drawn attention to the fact that the rate of sedimentation is depressed by dilution of the blood. In a recent series of cases we obtained the following results:

Number of subjects examined	18
Mean second-hour reading (original Westergren method)	22.3 mm.
Mean second-hour reading (dry ammonium and potassium oxalate method)	25.8 mm.

Although the mean value for the oxalate series is greater than that for the citrate series, individual results in the former were not uniformly greater than in the latter. Thus the results for the second hour were as follows: oxalate series greater than citrate series, 12 cases; citrate series greater than oxalate series, 5 cases; both series equal, 1 case. Muller (loc. sit) states that results are influenced according as potassium oxalate and potassium and ammonium oxalate mixture are employed. She cites the opinion of Keen, who found that the readings obtained with potassium oxalate were accelerated and supported the clinical assessment of activity in each case examined, whereas readings with the double oxalate mixture were diminished or within normal range.

3. *Lack of a Uniform Standard of Normal Values.*—There is no agreement as to what constitutes a normal sedimentation rate, even when the same method is used. Westergren adopted the following standard for the one-hour reading: normal, 3 mm.; doubtful, 4 to 6 mm.; probably abnormal, 7 to 12 mm.; certainly pathological, 13 mm. and upwards. Most writers accept as abnormal any reading greater than 10 mm., although Young (1944) regards values as low as 3 mm. in a male and 5 mm. in a female for the first hour as abnormal. Dunlop and Dick (1944), using a 200-mm. Westergren tube and dry potassium oxalate as anticoagulant, regard as abnormal any reading greater than 5 mm. for the one-hour reading.

4. *Disregard of Physiological Variations.*—The consensus is that the only physiological state which causes an appreciable increase in acceleration is pregnancy (Muller, loc. cit.; Wintrobe, 1942), although Obermer (1943) found that some healthy women, for reasons not known, consistently show an increased rate during menstruation. A perusal of Wintrobe's figures shows that, apart from pregnancy, an appreciable number of young adults give readings above the accepted range of normality. Using a mixture of dry ammonium and potassium oxalate as anticoagulant and a 100-mm. tube Wintrobe found that the rate of sedimentation varied from 0 to 6.5 mm. at the end of an hour in 86% of 137 healthy young adult males and from 0 to 15 mm. in 88% of 100 young adult females. He found that the differences were largely accounted for by variations in the haematocrit value, and that when this was corrected to a red-cell volume of 47 c.cm. per 100 c.cm. the rate in 72% of males and females was 0 to 6 mm. and in an additional 16% 7 to 10 mm. for the one-hour reading. There still remains, however, 12% of subjects with a reading greater than 10 mm. We found that 18 of 55 (original Westergren method) and 23 of 62 (dry potassium and ammonium oxalate method) healthy hospital nurses had a one-hour reading greater than 10 mm.

In a group of schoolboys aged 14 to 15 years tested by us 5 of 37 gave a first-hour reading greater than 10 mm. (dry potassium and ammonium oxalate method). On the other hand, among adult male subjects, only 1 of 59 (original Westergren method) and 2 of 76 (dry ammonium and potassium oxalate method) had a one-hour reading greater than 10 mm. The subjects in all these groups were apparently healthy. All had been subjected to a thorough physical examination, although not in every case, at the time the raised sedimentation rate was recorded. Skiagraphic examination of the chest was carried out in each case (on the same day as, or within a few days of, the finding of the raised sedimentation rate), and in none was any abnormality noted. Even if one accepts the hypothesis that the raised rate was due to some occult focus of sepsis, the fact remains that a considerable number of healthy subjects are liable to exhibit accelerated rates—a finding which must always be borne in mind when considered in association with abnormal skiagrams. That an appreciable number of healthy persons exhibit accelerated rates is confirmed by the work of Edwards, Penman, and Blair (1945), who found that the normal sedimentation rate in apparently healthy hospital nurses can be surprisingly rapid. They found that when primary tuberculous infection occurred the sedimentation rate increased considerably. In cases showing a satisfactory response the rate returned to the normal level for the particular subject in about a month. It would thus appear from these results that, in the female subject at least, it is necessary to learn from serial readings the physiological rate for the individual before any conclusions can be drawn from a single estimation.

The opinion is still widely held that the sedimentation rate is constantly raised in cases of active tuberculosis. Kayne, Pagel, and O'Shaughnessy (1939) and Hollins (1942) have even suggested that the test would be of value in the mass investigation of the apparently healthy. Under this arrangement only those subjects showing an elevated rate would undergo *x*-ray examination. Berrington and Greenwood (1942) employed this method in a mental hospital, and formed the opinion that it is rare to find active tuberculosis with a normal rate. It is difficult to understand how they arrived at this conclusion, since in their scheme active cases with a normal rate would not be examined. When the results obtained by mass radiography are studied an entirely different picture is presented, as the following table shows:

Reference	No. of Subjects with Active Tuberculosis Examined	No. with Abnormal E.S.R.
Stiehm (1933)	69	33
Braeuning (1938)	75	33
Clive (1943)	102	84
Kahan and Close (1944) ..	138	27
Robinson (1944)	45	35
Abeles and Pinner (1944) ..	91	54

It may be argued that, since tuberculous foci may undergo reactivation with considerable rapidity, it is insufficient to claim as active a case showing a normal E.S.R. merely on the strength of changes seen on serial skiagrams. Recently we had the opportunity of performing gastric lavage on the same day as, or within a few days of, the performance of the E.S.R. in seven cases. The former examination gave a positive result in each instance. The one-hour E.S.R. reading was greater than 10 mm. in three cases only, and two of these were females.

In the male subject the test may be of limited value, although the information required by the physician in assessing a case can generally be obtained more accurately without its use. Since in the female subject the test carries an error of anything from 12 to 30% its employment is, for practical purposes, valueless. No other test having an error of this magnitude would be tolerated in practice. Those seeking guidance on the E.S.R. should follow the advice of Hilliard (1942), who "abandoned the use of blood sedimentation tests long ago."—We are, etc.,

D. G. McIntosh.
D. M. Keay.

Dundee.

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"Perspex" in Orthopaedics

SIR,—In his letter (Oct. 13, p. 512) Mr. A. MacGowan levels a great deal of criticism against the article on "perspex" in orthopaedics by Scales and Herschell (Sept. 29, p. 423). I would suggest that he has failed to appreciate that the authors do not advocate "perspex" as a complete substitute for plaster-of-Paris and that they have not recommended that it should be used for short-term cases; surely the list of conditions given, including tuberculosis of the spine and anterior poliomyelitis, consists entirely of those requiring many months of treatment in some form of splint.

He complains that the authors of the article do not make use of the advantages they quote; with this complaint I disagree and instance the following. In the treatment of a case of tuberculosis of the spine with or without sinuses in a young child a "perspex" bed has the following advantages over one made of plaster-of-Paris: it can be washed without deterioration, it needs no absorbent lining, it is non-irritant to the skin, and even Mr. MacGowan must concede the point that it is reclaimable; in treating cases of anterior poliomyelitis "perspex" has the additional advantages that it is light in weight and, being waterproof, it can be worn when doing exercises in the pool.

To give a specific example where "perspex" is of great value I have had some splints made of it for opponens pollicis paralysis, and have a patient with bilateral paralysis who, without the splints, found considerable difficulty in washing, using a tooth-brush, and dressing himself, but when wearing the splints he is able to carry out all these actions easily and comfortably, and added to this the splints are inconspicuous—a factor of great importance, at least to the patient.

Surely no one suggests that "perspex" is a complete substitute for plaster-of-Paris, or that it is the ideal plastic for all selected orthopaedic conditions; but let us at least recognize its advantages, and acknowledge that Scales and Herschell have overcome several obstacles in its use—obstacles which some of the commercial experts considered were almost insurmountable. Further investigations in the use of plastics in orthopaedics are needed and are continuing at Stanmore.—I am, etc.,

Royal National Orthopaedic Hospital, Stanmore. JOHN A. CHOLMELEY.

Third-generation Syphilis

SIR,—There appeared a case report by Dr. C. J. V. Helliwell in the *Journal* of Aug. 11 (p. 186) purporting to be one of third-generation syphilis. The boy appears to be a congenital syphilitic, but evidence is lacking to indicate that his mother is. Dr. Helliwell based his case on the negative blood test in her husband, the statement that she never had syphilis, but that her parents died of it. It is not unusual for a woman to be ignorant of ever contracting syphilis. There was no supporting evidence that her parents really died of the disease.

It is recognized that conjugal syphilis occurs less frequently from wife to husband than husband to wife. The age of the infection in the sexual partner is an important factor. Such data as her present age and first sexual exposure were not included in the report.

The occurrence of third-generation syphilis is recognized. Its frequency is unknown, since the facts are not always obtainable. Basic necessary information was not included in the report to justify the conclusion.—I am, etc.,

C. C. WEDDERBURN, M.B., Ch.B.,
Medical Department, Kingston, Jamaica. Venereal Diseases Officer.

Infant Feeding and Duodenal Ulcer

SIR,—There is undoubtedly an increase in the incidence of duodenal ulcer at the present time, and it seems to be occurring at a more early age. The custom of feeding infants at four-hourly intervals by day, and of giving no feed at all during the night, began to be taught and rigidly followed after the 1914–18 war. The hungry child very often spends the last hour of the period yelling lustily, while the conscientious parent parades the floor with an eye on the clock until the appointed hour arrives. This must mean that for several hours by day and for a longer period during the night the child's stomach is in a state of anticipatory peristalsis, actively secreting hydrochloric acid, and with probably an accompanying pylorospasm. In a child of sthenic habit this may provide the predisposing factors for the development of ulcer in later life. The remedy would appear to be more frequent feeding of this type of infant by day and permitting a feed during the night.—I am, etc.,

Dundee. J. M. MORGAN.

Housing, Health, and Unwise Spending

SIR,—I would like to supplement Dr. Frewen Moor's comments (Oct. 13, p. 508) on Dr. H. Nelson's valuable paper on housing and health. It is not sufficient to enumerate the common types of unwise spending by the poorer classes; we must try to understand the reasons for it. Take, for instance, the family living in a three-roomed back-to-back or four-roomed dwelling of the type still occupied by probably the great majority of the city working classes. On what can they spend their "surplus" earnings? The cramped squalor of the home precludes the pursuit of any hobbies or cultural or constructive interests of any kind. The more well-to-do family has a garden, spare ground on which to build a workshop, enough rooms and big enough rooms in which to entertain friends or indulge in relaxation. The urban working-class family lives under or on top of another family, or is jammed up on each side with a number of similar families; and they all have children. In addition to the crowding and the squalor there are therefore the ceaseless noise and lack of privacy. The home, in fact, is a place to get away from. In such circumstances *what* can the wage-earner spend money on but cigarettes, cinema, betting, and drink? Even to keep a bicycle may be impossible for want of a place to house it. In my opinion it is of immense importance that this aspect of the life of our poorer classes should be given prominent attention in the planning of our future cities.—I am, etc.,

Birmingham. E. H. WILKINS.

Training for Released Service Doctors

SIR,—Lieut.-Col. F. F. Hellier in his letter (Oct. 6, p. 477) raises a most pertinent point and one of great import to those in the Services about to be released.

I should like to give my personal experience of applying for a Class III appointment as a registrar in dermatology at a salary of £550 per annum. The necessary form of application was forwarded to the British Postgraduate Medical School and a personal visit made immediately I was demobilized. My qualifications and reasons for applying were stated as follows:

(1) I was keen to become a dermatologist, and at the beginning of the war was hon. assistant dermatologist to the Royal United Hospital, Bath, following the appointment of medical registrar to that hospital. I had not started as a consultant in private and was still in general practice in a town 7 miles away.

(2) I wish to study at the same time for a higher qualification in order to be in a position to apply for hospital staff appointments.

(3) The lease of my house, from which I practised, had been terminated by me in 1943, at the first option (10 years), as I did not intend to return to general practice. I have been unable to sell the practice and there is now only a nucleus which, without a house, appears difficult to sell.

I was informed that I was ineligible under the Government scheme Class III (Registrarship) as I had been established before the war in general practice and had not sold my practice, and would also have been ineligible had I started as a consultant in private. The only class open to me was Class II (14 days' refresher course for general practitioners).

Surely the Government policy is to assist in training men who may later prove useful members of the staffs of hospitals treating large numbers of the community over a period of years, and not to exclude men on technicalities from financial assistance with postgraduate study. The only course open to me now is to do postgraduate study at my own expense, and therefore for a short period (three months) due to financial limitations.

The above facts will, I think, be of interest to those in the Forces who may be trying to work out their post-war plans and are expecting financial assistance from this source.—I am, etc.,

C. D. Evans,
Late Colonel, A.M.S.

Nutritional Macrocytic Anaemia: Correction

We apologize for a misprint in the letter on nutritional macrocytic anaemia by Dr. L. E. Glynn, Prof. H. P. Himsworth, and Dr. A. Neuberger, published last week (Oct. 20, p. 550), by which the word "devoid" was omitted in the seventh line. The sentence should run: "It may therefore be of interest to your readers to know that recently we have found that rats on a diet devoid of methionine develop a macrocytic anaemia characterized by changes in the peripheral blood and in the bone marrow similar to those in human nutritional macrocytic anaemia. . . . The development of this anaemia is not prevented by large supplements of cystine or of iron."

Obituary

W. B. CANNON, C.B., LL.D., M.D.

A wide circle of physiologists the world over will feel a personal loss by the passing, on Oct. 2, of Dr. Walter Bradford Cannon, who for many years held the George Higginson Chair of Physiology at Harvard University. Though a world figure in science, Cannon was essentially a Harvard man, for there he graduated in 1896, and there, with characteristic fidelity, he remained with few interludes until his retirement in 1942, first as instructor in zoology, then in physiology, next as assistant professor of physiology, and finally from 1906 to 1942 as professor.

He was one of the now rapidly dwindling number of all-round physiologists whose inspiration, exerted through generations of pupils, will long continue to be felt, and few scientific men can hope to have both so wide and so beneficial an influence on the evolution of their subject as was his. He brought to his subject not only wide experience and knowledge, but also a broad philosophy, an artistic imagination, and an admirable clarity of expression. His initiation in 1898 (at the age of 27) of the technique of the opaque meal in *x*-ray study of the movements of the alimentary canal was by itself enough to ensure him an important place in the history of the medical sciences. The classical work of Cannon and his collaborators, now generally known, and summarized in his *Bodily Changes in Pain, Hunger, Fear, and Rage*, was an outstanding example of the value of imagination in research, and his book *The Wisdom of the Body* was a further revelation of his wide philosophical outlook on biological phenomena. The accepted theory of the humoral transmission of the nerve impulse has much of its factual foundation in the series of investigations by the Harvard School, led by Cannon.

In the interlude occasioned by the first World War he served in the British Military Service in 1917, and engaged in work on traumatic shock, partly in collaboration with the late Sir William Bayliss. He later became a lieutenant-colonel in the U.S. Army Medical Corps, and served with it till 1919. He was decorated C.B. in 1919, and awarded the Distinguished Service Medal of the U.S.A.

Many other honours and distinctions very properly fell to his lot. Among these were Croonian Lecturer, Royal Society, 1918; foreign member, Royal Society, 1939; Linacre Lecturer, Cambridge, 1930; Baly Medal, Royal College of Physicians of London, 1931; President, American Association for the Advancement of Science, 1940; honorary degrees of Yale, Liège, Strasbourg, Paris, and Madrid; foreign member of several learned academies; Harvard exchange professor, 1929–30; and visiting professor to Peiping Union Medical College, 1939.

He died at the age of 73, after a good deal of ill-health. His calm, happy personality will be remembered with affection by those whose privilege it was to know him.

C. L. E.

T. P. PUDDICOMBE, D.S.O., M.B., D.P.H.

Dr. Thomas Phare Puddicombe, who died suddenly at Great Torrington on Sept. 29, was born in 1877, the youngest son of Robert Puddicommbe of Kilverleigh Manor, Beaford, North Devon. He was educated at West Buckland School, King's College, London, and St. Thomas's Hospital. He served with distinction in France from November, 1914, to May, 1919, in command of the 25th Field Ambulance, with the rank of lieut.-colonel, R.A.M.C. He was thrice mentioned in dispatches and was awarded the D.S.O. Before this he had entered the Local Government Service in 1906 and saw service at Croydon as deputy medical officer of health and at Plymouth as senior medical officer before going to Essex in 1920 to fill the new post of deputy county medical officer of health in 1930. Thus when he retired in 1942 he had seen 35 years' service with local authorities, 22 of which had been spent with the Essex County Council.

Dr. W. A. Bullough writes:

When we in Essex heard of his death our minds went back to the day he left us in March, 1942, when so many good things were said about him by all ranks in the service, from the chairman of his committee to the humblest member of the clerical staff of the Public Health Department. His own quip (he was full of quips and pleasantries) on this occasion was that he felt like a man attending his own funeral, because that was when most nice things were said about people. We feel some pleasure that we were able to say these things to his face and have not left them all to be said after he is dead. His geniality, kindness, sympathy, and consideration will long be remembered by those who came into contact with him, particularly a very wide circle of parents in Essex, who have much reason to be grateful to him in his capacity as mental expert for his tact and kindness. If there was a problem to be solved that involved the human element, official or unofficial, "Tay Pay" (as he was affectionately known) was the man to solve it, and he is gratefully remembered as a guide, philosopher, and friend by many in Essex. Those who were privileged to visit him in his bungalow in Rothesay Avenue, Chelmsford, saw the foundation of his character—a great home lover, one who was proud of his home and his garden. He was keen on indoor and outdoor sport—he founded and was the moving spirit in a Badminton Club in Chelmsford. Whatever the game, he played with enthusiasm and vigour. Truly he was a leader of men in more ways than one.

Personally, I was most indebted to him for his great loyalty. No matter how much we disagreed, one could always depend upon "Tay Pay" to be loyal to the extreme. His industry amazed me: quietly and methodically he got through an immense amount of work. And, above all, I admired and liked him for his straightforwardness. If he disagreed he said so, and that was the end of it. One always knew that what he said he meant. I always found him willing to do anything, and he had that inestimable characteristic which made him an ideal deputy—a complete absence of self. I never had any fear about the School Medical Service in Essex under his control, and he never let me down. In his capacity as mental expert I never found a flaw in his diagnoses and estimations.

Outside Essex he had many interests. He was a Fellow of the Society of Medical Officers of Health, and for many years represented the School Medical Group on the executive committee of the society. He was a member of the Central Association for Mental Welfare, and was also keenly interested in the Essex Rural Community Council, and was, in fact, chairman of the health committee for many years. He also gave much attention to the scheme for the preservation of rural England. He was greatly missed by the council when he left Essex. He told us that he intended to live the life of a country gentleman in the West Country when he retired, and we felt that there was no one more fitted to do so. Some of us were privileged to spend short wartime holidays with him among his own folk. It is fitting, indeed, that he should have died in his own beloved Devon. To his wife and son, Capt. Robert T. M. Puddicombe, R.A.M.C., who arrived home on leave from Italy just too late to see his father alive, we extend our deepest sympathy.

Dr. Gerald Quin Lennane, who held the post of M.O.H. for the metropolitan borough of Battersea from 1906 to 1934, died on Sept. 12 after a long illness. He was born at Galway in 1869, and after qualifying in Dublin in 1891 went to sea as a ship surgeon, and then took the F.R.C.S.I. and the D.P.H. in 1900. In 1914, at the age of 45, he volunteered for a commission in the R.A.M.C., served in France, was mentioned in dispatches, and awarded the Military Cross in 1917. After

returning to civil life he was for 16 years examiner in hygiene at the R.A.M. College, and Battersea Borough Council named a block of flats after him in recognition of his long and valuable service. Dr. James Fenton in the course of a tribute in the *Medical Officer* has written: "It was Lennane's custom to get in touch with young men on their first taking up an appointment as M.O.H. of a metropolitan borough and offer his advice and experience in any problems which might present themselves to the newcomer. This approach was always made in a kindly way, and was often associated with Lennane's well-known hospitality. The only reward he wanted was the knowledge that he might occasionally be of some help. In debates at meetings of the Metropolitan Branch of the M.O.H. Society and at his club he displayed an old-world courtesy which endeared him to his wide circle of friends. In Battersea he was highly respected by his councillors for the courageous way he tackled many public health problems.

We regret to record the death on Sept. 14 of Dr. George Hall of Stockton-on-Tees, at the age of 66. He was born at Macduff, Banffshire, and educated at Banff Academy Grammar School and at King's and Marischal College, Aberdeen. At Aberdeen University he graduated M.A. in 1900, proceeding M.B., Ch.B. in 1905. He had been a member of the B.M.A. for nearly forty years, contributing an article on "Spontaneous Inversion of the Uterus" to the *Journal* in 1908. Having travelled round the world after completing his studies he took up practice in Stockton. For 38 years he was in close touch with the Stockton and Thornaby Hospital, being appointed hon. surgeon in 1918, and continuing on the honorary staff until 1944, after having served five extra years at the request of the hospital committee. He was chairman of the Stockton Division of the B.M.A. from 1929 to 1931 and an important member of the committee of the North of England Cancer Research Campaign for many years. A colleague writes: Not merely as physician and surgeon will George Hall be missed in the whole district but as a beloved friend. He was a humble, reticent, and tireless worker in the community, being held in high esteem and affection by colleagues and townspeople alike, countless of whom owe their well-being and very lives to his skill and unbounded devotion to duty. A gloom has been cast over thousands by his passing and he will be sorely missed by his patients and friends.

Mr. Ralph Marsh de Mowbray, F.R.C.S., of Lymington, Hants, who died on Sept. 24, had been for many years surgeon to the Lymington Cottage Hospital and the Milford-on-Sea War Memorial Cottage Hospital, and consulting surgeon to the Fenwick Cottage Hospital at Lyndhurst. Born at Vinossington on Oct. 16, 1887, son of the Rev. J. H. M. de Mowbray, he entered St. Thomas's Hospital in 1905 from Marlborough College and qualified in 1914, taking soon afterwards the F.R.C.S. During the war of 1914–18 he served first for a year at the British Red Cross Hospital at Netley, and then for over three years, with the rank of captain, R.A.M.C., as surgical specialist and officer in charge of the surgical division of No. 34 General Hospital at Deolali, India. Mr. de Mowbray had also been house-surgeon, casualty officer, and resident anaesthetist at St. Thomas's Hospital, and house-surgeon at the Royal Hants County Hospital, Winchester. He joined the British Medical Association in 1919.

Dr. David Johnston Jones, who died at Llandudno on Sept. 24, aged 91, was educated in Edinburgh, London, and Paris, graduating M.B., C.M.Ed. in 1876, and M.D. in 1879. After serving as house-surgeon at the Liverpool Royal Infirmary he became senior assistant medical officer to the Kent County Mental Hospital, near Maidstone, and was then for a long time medical superintendent of the L.C.C. Mental Hospital, Banstead. Dr. Jones joined the British Medical Association in 1880. At the date of his death there were only three living members with as long a membership of the Association, though 66 years is not a record, the late Sir James Crichton-Browne having remained in membership for 69 years.

Dr. William McDougall, who died on Sept. 29, had practised for 48 years at Wallington in Surrey. The son of a Highland minister, he went to school at Aberdeen and then to the University of Edinburgh, where he graduated M.B., C.M. in 1889. After a sea voyage, and a house appointment in Carlisle, he settled in the remote township of Tongue, on the north coast of Scotland. His work there demanded journeys on horseback as far as forty miles from home, over wild country: a single visit to a patient with pneumonia would sometimes take him two days and a night. After his first marriage he came south to a very different kind of practice in a village two or three miles from Croydon, where something of a Scottish community was forming round the Presbyterian church. In half a century Wallington grew out of recognition, and Dr. McDougall, having started work alone, eventually became the senior partner of a firm of four. In 1913 he had joined forces with Dr. A. T. Moon, F.R.C.S., and in 1916–17 he was able to spend a year in the R.A.M.C. at the Connaught Hospital, Aldershot. From the foundation of the Carshalton War Memorial Hospital, about 1923, he was a member of the active staff until he became consulting physician ten years ago. "He was," writes a colleague, "a first-class physician, painstaking to a degree. Restrained and even dour with strangers at first, he had a friendliness and understanding which stirred the affection of his patients into a devotion deep and abiding. He was a man of unalterable integrity whose whole life was a service to his fellows, carried to the full and to the end. His rare and deep humour, his generosity to all in need, and the religion he lived so thoroughly, made him an example which his friends must always remember, and which must always influence them." Dr. McDougall died at 79 years of age, having doggedly continued his work throughout the war. He leaves a widow and two sons and two daughters.

Dr. James Cecil Mottram, director of the research laboratories of Mount Vernon Hospital, Northwood, died on Oct. 4 at Northwood. He was born at Holt, Norfolk, on Dec. 12, 1880, only son of James Mottram, and was educated at the Beacon School, Sevenoaks, University College and Hospital, London, and St. John's College, Cambridge. He graduated M.B.Lond. in 1903, and took the D.P.H.Camb. in 1906. After working as first assistant at the Ayr County Asylum and bacteriologist for the County of Worcester he became first assistant in the cancer research laboratories of the Middlesex Hospital. During the war of 1914–18 he served as lieut., R.N.V.R., attached to the Royal Naval Experimental Station, Stratford, and advisory expert at the Camouflage School, G.H.Q. After returning to civil life Mottram was appointed director of the research department of the London Radium Institute, and continued in that post when the Institute joined up with the Mount Vernon Hospital at Northwood. He made numerous reports to the Royal Society, to the Royal Society of Medicine, the Linnean Society, the Zoological Society of London, and the Pathological Society, on cancer, radiology, and animal coloration. The last-named subject was, with fly-fishing and the study of trout and trout fisheries, Mottram's principal hobby. He wrote articles on animal coloration and on camouflage for the *Encyclopaedia Britannica*.

Dr. Ernest Le Cronier Lancaster, formerly a leading member of the profession in Swansea and well known as a naturalist, died at Lyme Regis, Dorset, on Oct. 4, in his 84th year. After taking his B.A., with first-class honours in science, at the University of Oxford in 1883, he went to St. George's Hospital for his clinical course, graduating M.B., B.Ch. in 1887. At St. George's he served as house-physician, resident obstetric assistant, and demonstrator in anatomy and physiology. He became physician to the Swansea Hospital, to the Aberavon and Port Talbot General Hospital, and to the Swansea and South Wales Institute for the Blind, and he attained the rank of lieut.-colonel, R.A.M.C.(T.). Dr. Lancaster joined the B.M.A. in 1892, was elected chairman of the Swansea Division in 1910, and president of the South Wales and Monmouthshire Branch in 1914. He was a past-president of the Swansea Medical Society, a J.P. for the County of Glamorgan, and for many years acted as honorary curator of the local museum; in retirement he undertook the same duty for Lyme Regis. Two branches of zoology attracted him most—the study of shells and shell-fish, and the study of molluscs—and he was for many years an active member of the Conchological Society of Great Britain and Ireland and of the Malacological Society of London. His professional writings were several papers in the *Transactions of the Clinical Society* during the 'nineties, and a paper on heredity and disease published in these columns in 1910.

Dr. James Macdonald Troup, consulting physician to the Pretoria Hospital and the doyen of the medical profession in that city, died on July 31 in his 78th year. A native of Huntly, in Scotland, he was the youngest son of the Rev. Robert Troup, and after early education at Madras College went to St. Andrews University, where he graduated M.A. with honours in 1887. He won the Guthrie Scholarship from St. Andrews to Cambridge, was 7th Wrangler in the Mathematical Tripos of 1890, and went on to King's College Hospital, London, with a senior scholarship. He took his M.B., B.Ch.Camb. in 1896, and was house-surgeon at King's to Watson Cheyne. In the following year he went to South Africa to an appointment at Grahamstown, and later for a time practised at Somerset East. He

settled in Pretoria in 1902, and during 43 years there his life was devoted to his patients; he soon gained a reputation for sound judgment and for skill in diagnosis and treatment; moreover, he was one of those practitioners whose advice and counsel were sought on many personal matters outside the strict range of his profession. The *South African Medical Journal* has published a number of tributes to Dr. Troup from colleagues, and a long appreciation of his character and gifts and his attitude towards the science and art of medicine by Dr. A. Pijper, written from 25 years' personal knowledge. One passage may be quoted here: "Troup had a persuasive manner and his authority was readily accepted. He was a marvellous diagnostician and had a horror of mechanized medicine, as it is called. Yet he used the laboratory to the utmost, but it was merely to confirm his ideas or to give him the needed quantitative data. If he had to subject a patient to more than one 'test' he blamed himself. Difficult cases were first discussed with the pathologist, on equal terms. Working with Troup was a delight to the laboratory-man. Even in the early days large numbers of his patients had laboratory work performed, and this being unusual in those days, I once asked him how the patients took it and whether it did not detract from his status. He countered by saying that the opposite was the case: his patients realized the purpose and that their doctor was on the right track." Dr. Troup had been a member of the British Medical Association since 1897.

Universities and Colleges

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Lister Memorial Lecture

Sir Howard Florey, F.R.S., delivered the Lister Memorial Lecture at the Royal College of Surgeons on Oct. 11, taking as his subject "The Use of Micro-organisms for Therapeutic Purposes"; it will appear in a future number of the *British Medical Journal*. At the end of the lecture he was presented with the Lister Medal for 1945 which had been awarded to him for his distinguished contributions to surgical science.

A quarterly meeting of the Council of the College was held on Oct. 11, with Sir Alfred Webb-Johnson, Bt., President, in the chair.

A Diploma of Fellowship was granted to David Barrett Feather (Leeds Medical School).

Diplomas of Membership were granted to the following successful candidates: W. H. Lonsdale, E. C. Hutchinson, P. M. Jeavons, C. H. de Boer, Lucy M. Dunkerley, R. L. Greenwood, H. Wainstead, H. A. Lane.

Diplomas in Physical Medicine were granted jointly with the Royal College of Physicians of London to F. J. Bach and E. J. Crisp.

Diplomas in Child Health were granted jointly with the Royal College of Physicians of London to the following successful candidates: H. I. C. Balfour, H. Blair, Agnes A. Brash, E. H. Brown, E. F. B. Cadman, A. Comfort, Nancy D. Cox, J. G. Dathan, R. L. J. S. Derham, Glenys M. M. Donaldson, F. R. M. Elgood, Elizabeth de C. Falle, I. W. Gallant, Susanna Gordon, Mona Griffin, G. R. Griffith, Ursula Jerram, A. Kahan, Margaret Kemsley, Vivien U. Lutwyche, Helen M. C. Morley, Joan L. Noak, G. E. Paget, Margaret Pardoe, H. E. Parry, P. E. Polani, Phyllis Poyner-Wall, L. S. Prasad, R. J. P. Pugh, Mary M. E. Rutter, Vivian M. N. Usborne, D. E. Yarrow, S. S. Yudkin, C. Zahra Neumann, H. L. Zondek.

A Leverhulme Research Scholarship was granted to Mr. P. B. Ascroft, F.R.C.S., for research on the pathology of head injuries.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

Dr. J. A. Nixon, Emeritus Professor of Medicine in the University of Bristol, will deliver the Dr. Alexander Black Lecture on "The Health and Safety of the Merchant Seaman" at the College (9, Queen Street, Edinburgh) on Friday, Nov. 2, at 4 p.m. The lecture is open to all graduates and senior students.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At the annual meeting of the College, held on Oct. 17, the following officers were elected for the ensuing year: *President*, Mr. J. M. Graham. *Vice-President*, Prof. R. W. Johnstone. *Secretary and Treasurer*, Mr. K. Paterson Brown. *President's Council*, Sir John Fraser, Bt., Dr. G. Ewart Martin, Mr. Francis E. Jardine, Mr. W. Quarry Wood, Mr. Walter Mercer, Prof. J. R. Learmonth. *Representative on the General Medical Council*, Mr. Henry Wade. *Convener of Museum Committee*, Mr. W. Quarry Wood. *Librarian*, Dr. Douglas Guthrie.

At a meeting of the College held on Oct. 17, with the President, Mr. J. M. Graham, in the chair, the following, having passed the requisite examinations, were admitted Fellows: J. Boyes, A. E. Bremner, J. A. Chalmers, A. W. Chambers, Prudence Halton, J. A. Harpman, G. Hay, W. A. N. Inglis, E. M. Innes, Alberta M. Jeans, Kathleen M. Long, R. N. Martin, D. Telford, N. Whalley.

The Services

Lieut.-Col. (Temp.) H. Rees and Major (Temp.) S. K. Datta, I.M.S., have been mentioned in dispatches in recognition of gallant and distinguished services in the field.

The following appointments and awards have been announced in recognition of gallant and distinguished services in North-West Europe:

C.B.E. (*Military Division*).—Brig. (Local) E. Bulmer, O.B.E., Brig. (Acting) J. T. McConkey, and Col. (Temp.) F. A. Bearn, D.S.O., M.C., R.A.M.C.

O.B.E. (*Military Division*).—Cols. F. G. Flood, M.C., and R. G. Shaw, M.C., late R.A.M.C.; Cols. (Acting) J. P. Douglas, M.B.E., and F. McL. Richardson, D.S.O.; Cols. (Temp.) J. P. J. Jenkins, T.D., H. E. Knott, and G. G. Talbot, T.D.; Lieut.-Cols. (Temp.) J. C. Anderson, W. S. C. Copeman, R. Evans, F. N. Foster, T.D., E. Hutcheon, A. B. Kerr, T.D., and W. R. Logan, T.D., R.A.M.C.; Cols. C. F. Abbott and C. G. Wood, Lieut.-Cols. D. Campbell, K. J. Coates, C. D. S. Leef, and J. Tanzman, R.C.A.M.C.

M.B.E. (*Military Division*).—Major R. B. Hunter, Majors (Temp.) D. J. Johnson, W. Michie, R. O. Murray, and R. O. G. Norman, and Capt. K. C. Burrow, R.A.M.C.; Majors W. A. McKibbon and E. Wolstein, R.C.A.M.C.

D.S.O.—Lieut.-Col. (Temp.) M. W. Gonin, R.A.M.C.

M.C.—Major (Temp.) J. L. Chisnall, Capts. R. D. S. Jack, G. D. H. McQuitty, I Morris, and J. Sheehan, and Lieut. R. W. Major, R.A.M.C.; Capt. K. A. Campbell, R.C.A.M.C.

The following appointments and mentions have been announced in recognition of distinguished services during the liberation of prisoners from German concentration camps.

O.B.E. (*Military Division*).—Lieut.-Col. (Acting) F. S. Fiddes, Lieut.-Col. (Temp.) J. A. D. Johnston, M.C., and Lieut.-Col. F. M. Lipscomb, R.A.M.C.

M.B.E. (*Military Division*).—Capts. P. O'Donnell and D. B. Peterkin, R.A.M.C.

Mentioned in Dispatches.—Major H. A. Tuck; Majors (Temp.) E. M. Griffin, G. M. C. Smith, and D. J. Waterston, M.B.E.; Capts. G. M. Baker, I. Gluck, J. Kraus, D. T. Prescott, and W. C. Winterbottom; Lieuts. S. Durrant and N. Winter, R.A.M.C.

Repatriated.—Major J. W. D. Bull, R.A.M.C.

Dalkeith Presbytery, in Midlothian, has sanctioned the erection in Newbattle Parish Church of a three-light stained glass window to commemorate the members of the R.A.M.C. who were stationed at Newbattle Abbey in the early years of the war.

Medical Notes in Parliament

On Oct. 18 the Parliamentary Medical Group met at the House of Commons and elected Dr. Haden Guest as chairman, Mr. Hugh Linstead as hon. secretary, and Sir Henry Morris-Jones as hon. treasurer. The Group decided to meet monthly. Its next meeting will discuss demobilization. Dr. Haden Guest was re-elected the representative of the Group on the Central Medical War Committee.

The Parliamentary Medical Committee of the Labour Party, under the chairmanship of Mr. Somerville Hastings, will work in close co-operation with the Health Group of the party.

Distribution of Medical Man-power

Mr. LAWSON stated on Oct. 16 that the present ratio of R.A.M.C. medical officers in the Forces to personnel under their medical charge is 2.57 per 1,000. All effective medical officers, whether engaged on administration, hygiene, hospital-work, or attendance on unit sick, are included in the ratio. The present proportion of doctors of all kinds in this country to the civilian population is 0.74 per 1,000. He added that circumstances and conditions in the Army and civil life are so different that any true comparison is impossible.

Sir GIFFORD FOX on Oct. 17 asserted that the present strength of medical officers in the R.A.F. was 2.27 medical officers per 1,000 men, which compared with one doctor per 3,500 of the civil population. He asked why it was necessary for the proportion of doctors in the R.A.F. to be eight times

that for the country as a whole. Mr. JOHN STRACHEY replied that the ratio given for the Air Force included doctors employed in hospitals on research and on administration as well as those on R.A.F. stations at home and abroad. On the other hand, the civilian figure for this country, which was about 2,500 per doctor, and not 3,500 as stated in the question, related to general practitioners, and excluded doctors working only in hospitals, on public health administration, and on research. A similar figure for the Air Force would be 1 in 1,000, out of which provision has to be made for a doctor at each active airfield. This ratio was less than was provided in peacetime. The distribution of medical man-power is now under review by the Government.

No. 30 General Hospital

Answering an inquiry by Sir John Mellor on Oct. 9, Mr. LAWSON reported that No. 30 General Hospital was sent to Norway on June 6, 1945. Its purpose was, in conjunction with other medical units, to provide for the care and treatment of the Allied occupation force and liberated Allied prisoners of war. He said 125 in-patients and between 300 and 400 out-patients were treated together with 559 dental cases. The records relating to out-patients were not available in the United Kingdom. The in-patients and dental cases were wholly Allied and mainly British. The total strength of the unit was 23 officers (including 18 R.A.M.C.), 40 nursing officers, and 159 others. The unit returned to the United Kingdom on Aug. 3, 1945. Mr. Lawson pointed out that when the unit was dispatched to Norway it was not known what difficulties would be encountered by the occupying force.

Release of Students

Mr. ISAACS stated on Oct. 9 that students eligible for release from the Forces in Class B include students in medicine, dentistry, and veterinary surgery recommended by the universities or the appropriate schools if these students had: (1) given up their reservation to join the Forces; or (2) joined the Forces before the present conditions of reservation were in operation, but would have been reserved if these had been in force. Only men in release groups 1–19, with substantially three years' service, were eligible. Mr. Isaacs added that he was not prepared to alter his policy for students who left the universities in the summer of 1945. Those who entered the universities in Oct., 1944, and subsequently could take a full course.

Britain and the Atom

Mr. ATTLEE said on Oct. 9 that the United Kingdom Government will be happy to share with the United States and Canada, and then with other nations, with the object of agreement on co-operation, in the development of atomic energy. The Government was pursuing its own studies through the Advisory Committee.

Cancer Statistics

A table issued by Mr. BEVAN on Oct. 11 shows that the death rates per million living (civilians only) from all forms of cancer in England and Wales during the years specified were as follows:

	Actual	Standardized
1940	1,723	981
1941	1,780	979
1942	1,834	977
1943	1,899	983
1944	1,897 (Provisional)	Not available

The standardized death rates are those which would have been recorded if the sex and age constitution of the population had been the same as in 1901.

Release of Naval Medical Officers

Mr. A. V. ALEXANDER in a written reply in the House of Commons on Oct. 12 said that until certain factors were known it would not be possible to give definite information regarding the release of naval medical officers. These factors were: complete information about wounded and invalids on distant stations, or naval personnel who had been prisoners in Japan; what arrangements could be made for bringing these patients home; and the number of doctors that could be recruited into the Navy in the coming months. The Admiralty expected to release Groups 9 to 19 by the end of 1945, and up to Group 30 by the end of June, 1946. At this rate release of medical officers would be only one or two groups behind the average rate for naval officers.

Tuberculosis: Accommodation in Sanatoria.—Mr. BEVAN stated that the number of patients awaiting admission to sanatoria is about 5,000. Above 1,600 existing tuberculosis beds are closed for lack of staff. A sufficiency of additional accommodation could be provided without much difficulty if staff for it were available.

Invaliding from the Far East.—In a written reply on Oct. 9 Mr. LAWSON recorded that the decision as to which individuals should be evacuated from the Far East on medical grounds was in general left to the medical authorities on the spot, who alone were in a position to assess all the factors in each case. The disposal of patients suffering from tropical illnesses had been carefully considered from time to time in the War Office and general policy defined. The majority of patients made complete recovery from tropical illnesses such as malaria and bacillary dysentery. Patients were invalided home when suffering from complaints which render continuation of service in the Tropics inadvisable.

Medical News

Sir Arthur MacNalty will give the Thomas Vicary Lecture on "The Renaissance: its Influence on English Medicine, Surgery, and Public Health" at the Royal College of Surgeons of England on Nov. 1, and Mr. C. Max Page the Bradshaw Lecture, entitled "A Survey of Fracture Treatment," on Nov. 8. Both lectures will be given at 5 o'clock.

A general meeting of the Paddington Medical Society will be held at St. Mary's Hospital, W., on Tuesday, Oct. 30, at 8.45 p.m., when Dr. H. L. Marriott will deliver a lecture on "Medical Progress during the War."

The annual general meeting of the Association of Anaesthetists of Great Britain and Ireland will be held at the Royal College of Surgeons of England (Lincoln's Inn Fields, W.C.) on Wednesday, Oct. 31, at 2 p.m. A film show will follow at 4.30 p.m. and, at 7 p.m., dinner in the College. On Thursday, Nov. 1, at 10 a.m., there will be clinical demonstrations.

No fees and no tickets of admission are necessary for the post-graduate course in rheumatism to be held by the Empire Rheumatism Council from Oct. 31 to Nov. 11, inclusive, at B.M.A. House. Details of the course were announced in the *Journal* of Oct. 13 (p. 516).

Prof. James Gray, F.R.S., will give a series of four lectures on "The Anatomy and Functions of the Brain in Lower Vertebrates" before the Royal Institution (21, Albemarle Street, W.) on Thursdays, Nov. 1, 8, 15, and 22, at 5.15 p.m.

A course of four lectures in celebration of the 50th anniversary of the discovery of *x* rays will be delivered by Dr. A. Müller and Mrs. Kathleen Lonsdale, D.Sc., F.R.S., before the Royal Institution (21, Albemarle Street, W.) on Tuesdays, Nov. 6, 13, 20, and 27, at 5.15 p.m. On Nov. 6 and 13 Dr. Müller will discuss "The Background of Röntgen's Discovery" and "After the Discovery of *X* Rays," and on Nov. 20 and 27 Dr. Lonsdale will speak on recent research work in the Davy Faraday Laboratory on "Atomic Movements in Crystals" and "Divergent Beam *X*-ray Crystallography."

A meeting of the Medical Society of the L.C.C. Service will be held at the Archway Histological and Group Laboratory, Archway Road, Highgate, N., on Wednesday, Nov. 7, at 3 p.m. The meeting will be devoted to pathology.

The annual general meeting of the British Medical Students' Association begins to-day (Friday, Oct. 26) at B.M.A. House, Tavistock Square, W.C., with an address by Lord Moran at 3 p.m. Guy's Hospital Students' Union has invited delegates and visitors to a dance in the evening. Business meetings will occupy Saturday morning and afternoon; Prof. J. A. Ryle will speak at 4.15 p.m. on "Social Pathology." During the evening a programme of medical films will be presented. Election of officers will take place on Sunday morning, to be followed by a discussion on plans for the coming year. Tickets have been booked for a concert by the London Philharmonic Orchestra in the afternoon. All sessions are open, but as accommodation is limited preference will be given to delegates and other members of the Association.

The annual general meeting of the Association of the Honorary Staffs of the Major (Non-teaching) Voluntary Hospitals of England and Wales will be held at the Royal College of Surgeons of England (Lincoln's Inn Fields, W.C.) on Friday, Nov. 9, at 2.15 p.m.

Dr. R. W. Durand has now returned from his service with the R.A.F., and has resumed his duties as secretary of the London and Counties Medical Protection Society, Ltd.

Dr. Joseph Victor Landor and Dr. Robert Kenneth McAll have been released from internment in Japanese hands.

A sessional meeting of the Royal Sanitary Institute will be held at Weston-super-Mare Town Hall on Saturday, Nov. 3, at 10.15 a.m., when papers will be read by Dr. C. G. Eastwood on "David and Goliath: A Plea for the Individual in Social Medicine" and by Dr. T. L. Scott on "The Movable Dwelling: Is it adequately Controlled?"

On Nov. 7 the Medical Sickness, Annuity and Life Assurance Society, Ltd., will move its head office from Cirencester to 7, Cavendish Square, London, where its new business department is already installed and inquiries can be dealt with.

Three cinematograph films on children's health, which will be available for non-theatrical showing from Nov. 1, mark a new departure in the long series of films made by the Ministry of Information for the Health Departments. They are intended particularly for parents and for all who have charge of children. They embody sufficient elementary physiology to explain the structure and working of the organs treated and to show why certain simple health precautions are important. Diagrams play a leading part in presenting the principles of structure. "Your Children's Eyes" runs for 19 minutes, "Your Children's Ears" for 17, and "Your Children's Teeth" for 15. As they are all sound films they cannot be used on a silent projector. They are available in both 35 mm. and 16 mm. They can be shown in any part of the country, by means of the Ministry of Information Mobile Units, to parents' and teachers' organizations or at meetings arranged by any organizations interested in health. They can also be borrowed, by any organization which has its own sound projector, from the Central Film Library, London, the Scottish Central Film Library, or the Film Library at Dartington Hall, Devon. Medical officers of Health may apply for these films from the Central Film Library through the Central Council for Health Education, Tavistock House, Tavistock Square, W.C.1, which can also arrange talks or lectures as part of the programme.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* during the week the only diseases which showed very much change in incidence were scarlet fever, which increased by 174, and dysentery, which fell by 57 cases.

The largest variations in the totals of diphtheria were increases in Lancashire 14, and Warwickshire 10, and a decline of 16 in Glamorganshire. There were 29 fewer notifications of whooping-cough in Yorks West Riding, and 20 more in Middlesex, than in the previous week. The notifications of measles were the lowest since it became notifiable; during the week one-quarter of the total cases were recorded in Lancashire. Four of the 15 cases of typhoid were reported from the metropolitan borough of Woolwich.

The total for dysentery has decreased for the third consecutive week. The largest returns were London 56, Lancashire 34, Surrey 19, Yorks North Riding 16.

In *Scotland* notifications of scarlet fever increased by 46, and of diphtheria by 33; there were 25 fewer notifications of acute primary pneumonia, 15 fewer of measles, and 14 fewer of whooping-cough. The rise in diphtheria was mainly in the west; the largest local rise was Glasgow 11, and in this city, also, scarlet fever rose in incidence from 64 to 100 cases. Although the total for dysentery increased by only 9, the two principal centres of infection showed rises from 12 to 19 in Edinburgh, and from 57 to 66 in Glasgow.

In *Eire* the infectious diseases of childhood were more prevalent. Diphtheria notifications were up by 42, whooping-cough by 44, and measles by 18. The higher incidence of diphtheria was general throughout the country. The two large centres of infection for whooping-cough were Clare, Killadysert R.D. 27, and Dublin C.B. 20. The notifications of diarrhoea and enteritis fell by 48, and the total, 62, was the lowest for the past eight weeks.

Quarterly Returns for Northern Ireland

Births registered in Northern Ireland during the second quarter of this year numbered 7,509, equivalent to a rate of 22.8 per 1,000, or 2.5 below the rate for the June quarter of 1944 and 1.4 below the average rate for the second quarters of the five years 1940–4. Infant mortality was 67 per 1,000 registered births, compared with 60 for the corresponding quarter of last year and 72 for the average of the second quarters of the five preceding years. Maternal mortality was 2.8 per 1,000 births, and 1.0 below the average rate for the five preceding June quarters. The general death rate was 12.0 per 1,000, being 2.2 below the five-years average. Deaths from infectious diseases included diarrhoea and enteritis under 2 years 58, whooping-cough 22, influenza 21, diphtheria 10. Pulmonary tuberculosis was the cause of 216 deaths, and other forms of tuberculosis 82, these numbers being 24 and 2 respectively below the average for the five preceding second quarters.

Week Ending October 13

The notifications of infectious diseases during the week in England and Wales included: scarlet fever 1,849, whooping-cough 970, diphtheria 565, measles 446, acute pneumonia 415, cerebrospinal fever 36, acute poliomyelitis 45, dysentery 286, paratyphoid 6, typhoid 10.

No. 40

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Oct. 6.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1945 (a)	(b)	(c)	(d)	(e)	1944 (Corresponding Week) (a)*	(b)	(c)	(d)	(e)
Cerebrospinal fever	38	1	23	—	1	24	1	15	1	1
Deaths		—	—				1	1		
Diphtheria	479	33	166	105	11	509	7	144	116	22
Deaths	12	1	—	1	—	10	1	1	—	—
Dysentery	207	56	108	1	—	390	42	134	1	—
Deaths				—	—				—	—
Encephalitis lethargica, acute	—	—	—	—		1	—	—	—	—
Deaths		1					—			
Erysipelas			43	10	3			52	13	—
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				62					39	
Deaths	47	7	18	15	5	59	6	30	20	4
Measles*	367	33	68	43	1	2,492	38	173	54	57
Deaths	—	—	—	—	—	3	—	—	—	—
Ophthalmia neonatorum	79	4	13	—	—	58	3	11	—	—
Deaths										
Paratyphoid fever	11	1	2 (B)	—	—	7	—	1 (B)	—	—
Deaths	—	—	—	—	—	1	—	—	—	—
Pneumonia, influenzal†	377	25	3	2	4	628	39	4	2	1
Deaths (from influenza)	8	—	4	—	—	19	3	2	—	1
Pneumonia, primary			121	13				173	15	
Deaths		17		4	5		21		7	6
Polio-encephalitis, acute	—	—				—	—			
Deaths		—					—			
Poliomyelitis, acute	29	3	—	3	1	19	—	11	2	—
Deaths		—					—			
Puerperal fever		3	17		—		1	13		—
Deaths										
Puerperal pyrexia‡	155	11	22	—	2	166	4	7	1	—
Deaths		—					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,683	135	318	27	45	1,932	41	321	27	57
Deaths	—	—	—	—	—	—	—	1	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	15	5	4	2	1	7	—	1 (B)	8	2
Deaths	—	—	—	—	—	—	—	—	1	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	909	55	30	60	7	860	50	77	38	5
Deaths	4	1	—	—	—	6	—	2	1	1
Deaths (0–1 year)	291	36	56	33	19	320	31	81	44	25
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	3,947	564	518	171	113	4,068	510	650	163	122
Annual death rate (per 1,000 persons living)			11·8	11·0	§			14·9	10·6	§
Live births	6,831	870	914	449	265	6,695	438	1057	397	269
Annual rate per 1,000 persons living				29·0	§			21·5	25·7	§
Stillbirths	200	11	29			212	18	44		
Rate per 1,000 total births (including stillborn)								40		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

‡ Includes puerperal fever for England and Wales and Eire.

§ Owing to movements of population, birth and death rates for Northern Ireland are still not available.

Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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ANY QUESTIONS?

Intermarriage of White and Black

Q.—The story has been going round of a white girl who married a white American and gave birth to a coal-black baby; subsequent investigation showed that one of the husband's very distant ancestors had been a negro. I tell my patients that if the negro ancestors were so far back that the man was white, then his baby could not possibly be coal-black, but I really do not know whether this is true. I also tell them that if a white man or woman marries a negro and has a lot of children, they will not be some pure white, some pure black, and some brown, and I tell them that none of the children will be piebald. I should be glad of information.

A.—The story has been going around for a very long time—probably for hundreds of years. The questioner is right in doubting it. A white girl and a man who passed for white, though actually of remote negro ancestry, could not have a black baby. The only element of fact which might account for such beliefs is that two persons, both of whom had negro ancestry (and not very remote at that) but who were themselves sufficiently light perhaps to pass for white, might have a child of medium colouring. Davenport, whose valuable monograph *Heredity of Skin Colour in Negro–White Crosses* (Carnegie Inst. of Washington, Publication 188, 1913) should be consulted, states: "At Jamaica I asked several highly intelligent coloured and white natives if they knew of cases of 'reversion' to black skin colour. All replies agreed in holding the idea mythical," so that apparently the story is not accepted, even popularly, in areas where crossing is frequent and there are abundant opportunities for observation. Perhaps some of Davenport's intelligent observers recalled the anecdote which is a sufficient commentary on another myth. A very dark-skinned lady explained how before her birth her mother had been greatly frightened by a black man who chased her down the street; to which the unsympathetic response was: "I guess he caught her."

The questioner is also right in telling his patients that the offspring of a negro–white marriage show relatively little segregation; the resulting mulattos tend to be of medium colour and variation is not wide. As would be expected if only a few main genetic factors were operative, there is much more variation amongst the offspring of mulattos who marry each other. In all probability Davenport's hypothesis of two main factors, if we allow for certain complications and add further minor quantitative factors and non-genetic variations, accounts for the facts reasonably well. Inherited "piebalding" is something quite different and is due to a dominant gene. It may appear in black or in white persons, though it is naturally much more striking in the former.

Increasing Weight

Q.—It is frequently difficult in persons who are under weight to bring about any increase, although they are apparently healthy and no signs can be found to indicate disease. I would appreciate advice regarding methods recommended.

A.—Of course it is important to exclude organic disease, and, apart from clinical examination, *x*-ray of the chest, blood count, and sedimentation rate should be undertaken. It is also assumed, in answering the question, that such endocrine disorders as thyrotoxicosis, Simmonds's disease, and Addison's disease have been excluded. After this, the most important cause of failure to gain weight, or of loss of weight, is psychological, not only as an obvious anorexia nervosa but in less tangible form. For this reason the psychotherapeutic approach should never be neglected. Providing there is no evidence of hypoglycaemia, insulin often proves useful—10 units of simple insulin ten minutes before breakfast and ten minutes before lunch. It is usually unwise to give it at night, in case a hypoglycaemic reaction occurs. In males testosterone has an anabolic effect, and the same is relatively true of oestrogens in women, but here one may have resulting disturbance of menstruation, and the water-retention factor may become troublesome if very large doses are used. The writer has found progesterone in large quantities of benefit in some cases, without any of the disadvantages of the oestrogens. Sedatives, rest, and reassurance have their place.

Safety against Carbon Tetrachloride

Q.—What safety measures should be recommended for workers using carbon tetrachloride?

A.—The first essential is adequate general ventilation; the second, a system of mechanical exhaust ventilation over any open vessels containing carbon tetrachloride. Workers with a past history of any liver disturbance, such as jaundice, gall-stones, or infective hepatitis, should not be allowed to handle the substance, nor those receiving arsphenamine treatment, nor pregnant women, nor any worker who has recently had a general anaesthetic such as chloroform. Whenever possible work on carbon tetrachloride should be alternated with periods of work involving no exposure to chlorinated hydrocarbons.

Schistosomiasis

Q.—Is there any means of determining whether any male schistosomes have survived a course of treatment for bilharzia infection? (Attention has been focused on the escape of ova and treatment usually discontinued when this ceases, though the male parasites predominate.) Can these inescapable worms cause interference with the circulation once they have become dislodged from their favourite sites? Are pathological conditions of the ureter in bilharzia cases due only to microbic invasion spreading up from the bladder wall?

A.—A quantitative fall and ultimate disappearance of the titre of the complement-fixation test for schistosomiasis would be evidence that the treatment had eradicated the infection. The technique of the test is similar to that of the Wassermann reaction, but an alcoholic extract of the livers of infected snails is used as an antigen. Drugs employed against schistosomes owe their value not only to their effect on the ova but also to the fact that they are lethal to the adult parasites. Their action is far more than one of dislodging the worms, and the death of the adults will result in cure of the disease within the limits of resolution of the concomitant pathological changes of the tissues of the host. Although microbic invasion from the bladder, and other secondary changes, account for a great part of the trouble in the ureter and kidneys in cases of schistosomiasis, specific invasion of the latter tissues may occur and ova have been found in these organs.

Fröhlich's Syndrome

Q.—What are the modern views on the treatment of Fröhlich's syndrome? Can one, for example, expect benefit from treatment with anterior-pituitary-like hormone, and does the obesity respond to thyroid extract and diet? Exact details of dosage would be welcomed.

A.—It may be as well to mention that Fröhlich's syndrome is, strictly speaking, a condition of obesity and sexual underdevelopment due to a tumour in the neighbourhood of the pituitary. Surgical treatment should be advised. The term is, however, loosely and inaccurately used to imply obesity and sexual underdevelopment without a tumour. It would seem that obesity in children may delay sexual development, for the treatment of the obesity by diet alone is followed by the attainment of normal sexual development. The obesity may be due to sedentary habits or overfeeding, but there is reason to believe that a functional abnormality of the hypothalamus is often present.

The patients may recover without treatment of any kind, but often a female distribution of fat and body hair persists when obesity and maldevelopment are no longer present. As these are embarrassing symptoms in a man, all patients should be treated in childhood. Diet alone is sufficient. Carbohydrates should be cut drastically, the necessary caloric requirements being made good so far as is possible by proteins. Very little salt should be allowed. Diuretics accelerate loss of weight. Thyroid should be given only when, as sometimes occurs, there is evidence of hypothyroidism. Anterior-pituitary-like hormone of pregnancy urine should be given only when the testicles are undescended—a not uncommon complication. It has no effect upon the obesity, but may accelerate the growth in size of the penis. It is best given only when the time of normal puberty is approaching.

The dose of thyroid is 1/4 grain increased gradually at fortnightly intervals until an increasing resting pulse rate or too rapid a loss of weight suggests that the limit of tolerance is at hand. It should then be omitted for a fortnight, and thereafter continued in a smaller dose. It is rarely necessary to give it at all, and should be given only when careful supervision can be exercised. The dose of A.P.L. hormone is 500 rat units twice weekly intramuscularly in alternate months.

Podophyllin for Warts

Q.—*What is known of the treatment of warts by podophyllin? Please supply references if possible.*

A.—Treatment of warts by podophyllin was described by Culp, C. S., Magid, M. A., and Kaplan, I. W., *J. Urol.*, 1944, **51**, 655; and MacGregor, J. V., *B.M.J.*, 1945, **1**, 593. A 25% suspension in mineral oil or a paste made with podophyllin and water is applied to penile, vulval, or anal warts or warts in other moist sites, for a period of six hours and is then washed off. Occasionally more than one application is necessary. In these sites the warts dry and drop off within a few days. Podophyllin is an irritant, but is rarely an effective measure except for the type of wart found in moist sites.

Prognosis after Splenectomy

Q.—*What advice and prognosis should be given to an otherwise healthy young man who has had a splenectomy owing to rupture as a result of injury?*

A.—Resistance to protozoan infections such as malaria is believed to be reduced by splenectomy. The patient should, therefore, be advised not to visit the Tropics, but apart from this no precautions are needed and the expectation of life and health is normal.

Terminating Pregnancy

Q.—*A married woman is suffering from severe pulmonary tuberculosis and also showing signs of myocardial degeneration. She has become pregnant, and I could have her curetted, but that involves the risk of an anaesthetic. Would it be possible to terminate her pregnancy by means of a glandular preparation—e.g., stilboestrol? If so, what would be the best method of administration and dosage?*

A.—When the foetus is dead but retained *in utero*, stilboestrol and other oestrogens, if given regularly over the course of 5 to 8 days, usually sensitize the uterine musculature to such an extent that expulsion of the products of conception occurs. If, however, as in this case, the pregnancy is alive, oestrogens, even in massive doses, do not produce abortion except on rare occasions when the patient is perhaps unusually sensitive. The same applies to the use of strong purgatives, quinine, ergot preparations, pituitary extracts, etc. Although the possibility of this patient or her uterus being susceptible might make some kind of medical induction worth trying, it is unlikely to be successful, and some form of operative interference will probably be required. The anaesthetic risk would be reduced to a minimum by the employment of a skilled anaesthetist, to whom the choice of anaesthetic should be left. Alternatively, it is possible to carry out dilatation of the cervix and to insert a pack or laminaria tents or even to evacuate the uterus, after infiltration of the cervix and the broad ligaments with a local analgesic. But if the condition of this patient is so grave as to warrant induction of abortion, there is much to be said for sterilization at the same time. In that case there can be little doubt that the ideal treatment would be to carry out abdominal hysterotomy and sterilization under local analgesia—a technique which is not difficult.

INCOME TAX

Expenses: Life Assurance Allowance

J. K. inquires (*a*) whether he can claim as an expense the fee of £5 1s. paid to the General Medical Council for *original* registration, and (*b*) whether the restriction of the life assurance allowance to one-sixth of the income is determined by gross income or gross income less allowable expenses.

*** (*a*) The fee in question would appear to be paid in order that the practitioner may exercise his profession rather than incurred in the course of his work. We think that the Revenue authorities might successfully contend that this particular payment was of a capital nature and therefore not allowable. (*b*) The phrase used in the statute is "one-sixth of the total income of the person from all sources estimated in accordance with the provisions of the Income Tax Acts." The earned income must therefore be taken at the assessable amount—i.e., the expenses must be deducted.

Locumtenent

T. L. states that most of his income is derived from work as locumtenent and that he is assessed on his annual earnings and not dealt with under the "pay-as-you-earn" system. Can he claim to deduct the expense of travelling between his residence and the places where he does locumtenent work?

*** If, as we gather, the changes in the locumtenencies are sufficiently frequent to justify T. L. in being regarded not as the employee of various practitioners from time to time but as carrying on his profession in a particular manner, then in our view he is assessable under Schedule D and not under Schedule E. If so, he should be regarded as carrying on his profession from his residence as the centre, and the expense of travelling should be allowed.

LETTERS, NOTES, ETC.

Breast-feeding of Infants

Lieut.-Col. W. E. C. LUNN-ROCKLIFFE, R.A.M.C.(ret.), writes: In a recently published book, *The Farming Ladder*, by George Henderson, I came across the following passage (page 68): "I once had the pleasure of studying some records kept by a farmer in Northern Ireland over many years, which showed conclusively that for production and longevity the cows which had been reared on two outlying small farms, with ample milk available, had far surpassed those reared under the farmer's own careful supervision on calf meal, where he was in a position to retail every pint of milk produced, and had therefore been misled into believing that calf-rearing with meal was more economical. It is useful in changing over from milk, and we use it, but we still believe that the cow will return a hundredfold the milk she received as a calf, or will withhold in proportion that part of her birthright of which she has been robbed, through the reduction in health and vitality resulting from it. It is not what a calf looks like at six months old that matters, it is how much milk she will be giving at six years old or later." If this is true of cattle may it not also apply to human beings, and explain to a certain extent the difficulty modern mothers appear to have in providing sufficient breast milk for their infants? Possibly their own mothers for some reason denied them their full quota of breast milk; hence the vicious circle.

Fish-bone embedded in Tonsil, Simulating Neoplasm

Mr. A. J. D'ABREU, M.B., F.R.C.S.Ed., writes from Newtown, Waterford: In January, 1926, a woman aged 61 consulted me for pain in her throat, shooting up towards her right ear, and slight dysphagia. She gave a history of swallowing a fish-bone a year ago, which she thought had stuck in her throat. She attended hospital in Swansea; no fish-bone was discovered, and she was treated with gargles, making repeated attendances at the hospital. On examination I found that the right tonsil was swollen and projected much beyond the pillars; I could see a slough on it. There was a small gland at the angle of the jaw. The tonsil felt hard on palpation, and yet it was not the hardness of a carcinomatous tonsil. The diagnosis was in doubt. Under regional analgesia the whole tonsil in the lingual prolongation, and the posterior pillar which appeared to be involved, were excised and "hemaplastin" injected around and into the tonsillar fossa. There was no post-operative bleeding, and the throat healed in due course of time with complete disappearance of symptoms. The whole mass was sent to the pathologist, whose report stated that there was no malignancy, that the tonsil was myxomatous, and that in its centre there was a fish-bone.

Bart's in the War

The Treasurer's latest report of St. Bartholomew's Hospital opens with these words: "Although this report is intended primarily to cover the activities of the hospital in 1944, I cannot put off till next year all reference to the vital events of the early part of 1945, culminating in the cessation of hostilities in Europe. For five and a half grim and tragic years our ancient hospital, standing in the heart of the City, battered and shaken by bombs and fire and rockets, has proudly carried on, without a break, its task of succouring the sick, the wounded, and the suffering. Never once during all that time were its doors closed. Often there was no water, no gas, no light. But still the hospital carried on. We are entitled to be proud of our record of over eight centuries of service, but never during its long history has Bart's added more lustre to its name, or earned more affection and regard, than during these years of war. The Governors are deeply conscious of the debt they owe to the medical, nursing, and lay staffs, whose untiring and devoted labours were so wholly in keeping with our ancient traditions and enabled the hospital to retain its record of continuous service unimpaired. We look forward now to brighter times ahead, but they are times which will be fraught with difficulties and problems allowing of no easing up of our efforts."

Disclaimer

Dr. G. ROCHE LYNCH (St. Mary's Hospital, Paddington) writes: Please allow me to inform your readers that I was in no way responsible for communicating to a reporter any statement to the effect that Her Majesty the Queen had at any time visited my laboratory. The article which has caused me serious misgivings appeared in the *Daily Express* for Wednesday, Oct. 17, 1945, and was entitled "Just near Paddington Station." Steps have been taken to register a strong protest with the editor of the newspaper concerned, pointing out the erroneous statements that have appeared in the article.

Correction

There was a mistake in the fifth line of paragraph 3 of Major H. L. Thornton's note on "Wide-bore Endotracheal Connexions" (Oct. 20, p. 534). The internal diameter of the distal end is *17 cm.* not 7.5.